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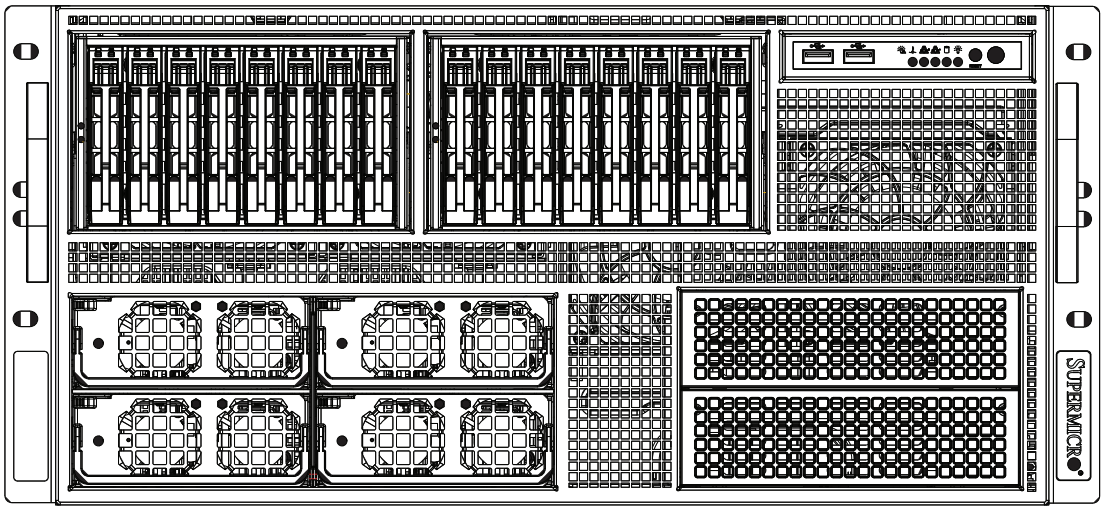
SUPERSERVER

5086B-TRF



USER'S MANUAL

1.0

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Manual Revision 1.0
Release Date: July 26, 2011

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5086B-TRF. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5086B-TRF is a high-density, 5U 8-way server solution housed in the SC758 rackmount chassis. It is built around one X8OBN-F baseboard, four processor (CPU) boards (X8OBN-CPU) and two bridge boards (X8OBN-BR1).

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X8OBN-F and the SC758 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5086B-TRF into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panels on the chassis as well the HDD carrier LEDs.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5086B-TRF.

Chapter 5: Advanced Setup

Chapter 5 provides detailed information on the X8OBN-F baseboard as well as the CPU boards (X8OBN-CPU) and bridge boards (X8OBN-BR1, and includes the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC758 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

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Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperServer 5086B-TRF is a high-density SuperServer comprised of several subsystems: the SC758 chassis, one X8OBN-F baseboard, four X8OBN-CPU processor boards and two X8OBN-BR1 bridge boards. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

Below is a list of the main hardware components included with the 5086B-TRF:

- Eight passive CPU heatsinks (SNK-P0044P+)
- Four air shrouds (MCP-310-75801-0N)
- Four 9-cm system fans (FAN-0121L4)
- Two 9-cm exhaust fans (FAN-0122L4)
- SATA Accessories
  One HDD backplane (BPN-SAS-I28A)
  Sixteen 2.5" hard drive carriers (MCP-220-97301-0B)
- One set of rackmount hardware (MCP-290-00057-0N)
- One CD containing drivers and utilities
- 5086B-TRF User's Manual

1-2 Baseboard and CPU Board Features

The 5086B-TRF is built around an X8OBN-F baseboard. Four X8OBN-CPU processor boards (linked together with two X8OBN-BR1 bridge boards) plug into the X8OBN-F baseboard. The X8OBN-F is based on the Intel® 7500 chipset (+ ICH10). Below are the main features of the X8OBN-F. (See Figure 1-1 for a block diagram of the chipset.)

Processors

Each X8OBN-CPU processor board supports single or dual Intel® Xeon 7500 Series 8-core processors and next generation Xeon E7 8800 family 10-core processors. Please refer to the product page on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The four X8OBN-CPU boards in the system have a total of 64 DIMM slots that can support up to 2 TB of ECC registered DDR3-1333/1066/978/800 SDRAM. See Chapter 5 for details.

SATA

The ICH10R portion of the chipset provides 3 Gbps SATA support over six ports. A total of 16 SAS hot-swap drives are supported. Notes: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SAS drives. RAID 0, 1, 5 and 10 are supported (RAID 5 supported in Windows only).

PCI Expansion Slots

The X8OBN-F can support four PCI-E 2.0 x16 and two PCI-E 2.0 x8 (in x16 slots) or 10 PCI-E 2.0 x8 standard size add-on cards.

Rear Chassis Ports

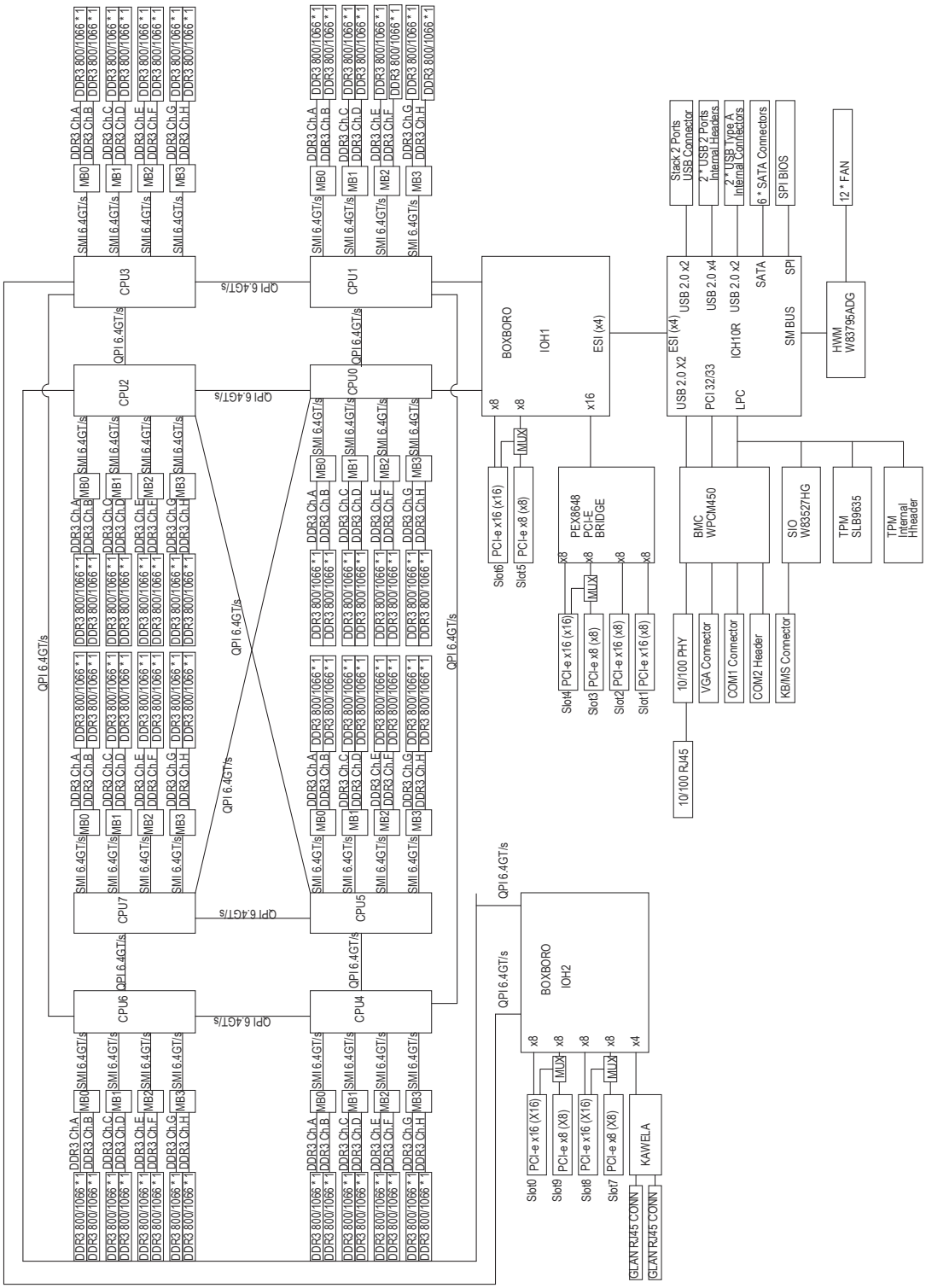
The rear of the chassis includes one keyboard and mouse ports, two USB ports, a COM port, a VGA port and three 1 Ethernet (LAN) ports.

Graphics Controller

The X8OBN-F features an integrated Matrox G200eW video controller. The G200eW is a 2D/3D/video accelerator chip with a 128-bit core.

Figure 1-1. Intel 7500 + ICH10R Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



1-3 Server Chassis Features

System Power

The SC758 features four Gold Level 1400W power supply power modules (2+2 redundancy) to provide 2800W of uninterrupted power. This power redundancy feature also allows you to replace a failed power module without shutting down the system.

Hard Drives

The SC758 supports up to 16 2.5" hard drives. Six of these may be 3 Gbps SATA drives as supported by the X8OBN-F baseboard. These drives are hot-swappable units and are connected to a midplane that provides power and control. Note: The operating system you use must have RAID support to enable the hotswap capability of the SATA drives.

Front Control Panel

The control panel on the SuperServer 5086B-TRF provides system monitoring and control. LEDs indicate system power, network (NIC) activity, system overheat, hard drive activity and power supply failure. Reset and power buttons are also found on the control panel.

Cooling System

The SC758 chassis has six 9-cm fans. The fans are hot-pluggable units that may be replaced without removing power from the system. An air shroud is also included to optimize air flow.

1-4 Contacting Supermicro

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Notes

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5086B-TRF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a baseboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

The 5086B-TRF may be employed either as a tower or mounted in a rack as a 5U rackmount chassis. If using it as a tower unit, please read the Server Precautions in the next section and then skip ahead to Section 2-5.

2-2 Unpacking the System

You should inspect the box the system was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the SuperServer 5086B-TRF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the system was shipped in may include two sets of rail assemblies, two rail mounting brackets and mounting screws needed for installing the system into a rack (optional kit). Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the system into a rack unit. Rack installation requires the use of a rackmount kit. If the system has already been mounted into a rack or if you are using it as a tower, you can skip ahead to Sections 2-5 and 2-6.

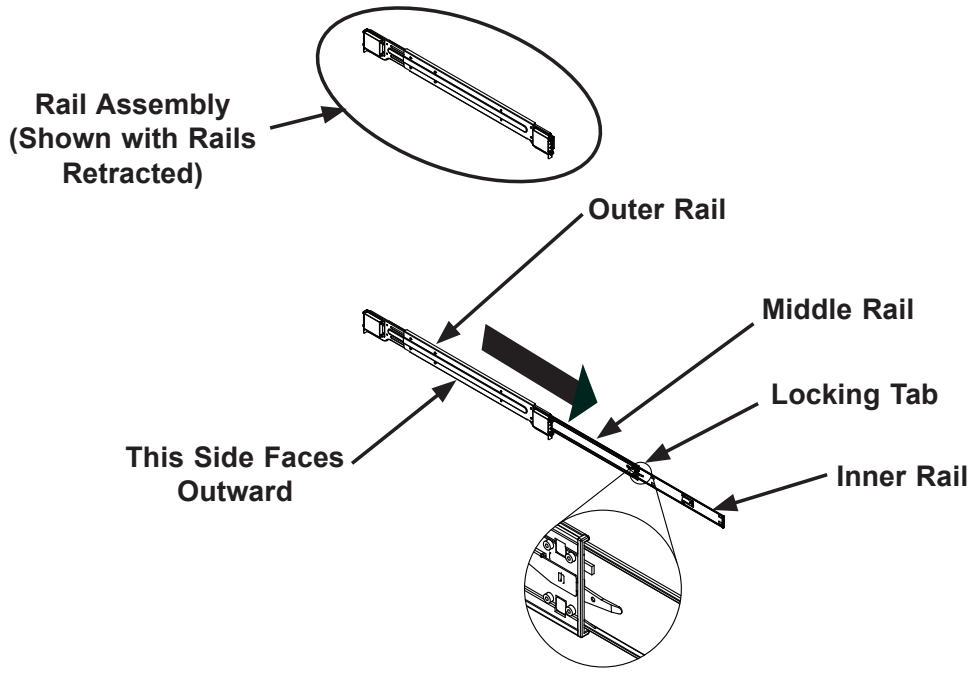
There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the server into a rack with the rack rails provided in the rackmount kit. You should also refer to the installation instructions that came with the rack unit you are using. **Note:** This rail will fit a rack between 26.5" and 36.4" deep.

Identifying the Sections of the Rack Rails

The optional rackmount kit includes two rack rail assemblies. Each of these assemblies consist of three sections: an inner fixed chassis rail that secures to the chassis, an outer rack rail that secures directly to the rack itself and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.

To remove the inner chassis rail, pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Depress the locking tab to pull the inner rail completely out. Do this for both assemblies (one for each side).

Figure 2-1. Identifying the Sections of the Rack Rails



Locking Tabs

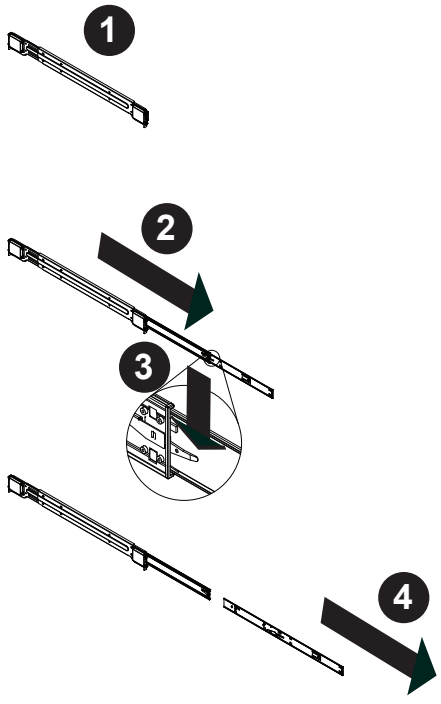
Each inner rail has a locking tab. This tab locks the chassis into place when installed and pushed fully into the rack. These tabs also lock the chassis in place when fully extended from the rack. This prevents the server from coming completely out of the rack when when the chassis is pulled out for servicing.

Releasing the Inner Rail

Releasing Inner Rail from the Outer Rails

1. Identify the left and right outer rail assemblies as described on page 5-4.
2. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
3. Press the locking tab down to release the inner rail.
4. Pull the inner rail all the way out.
5. Repeat steps 1-3 for the second outer rail.

Figure 2-2. Extending and Releasing the Inner Rail



Installing The Inner Rails on the Chassis

Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.

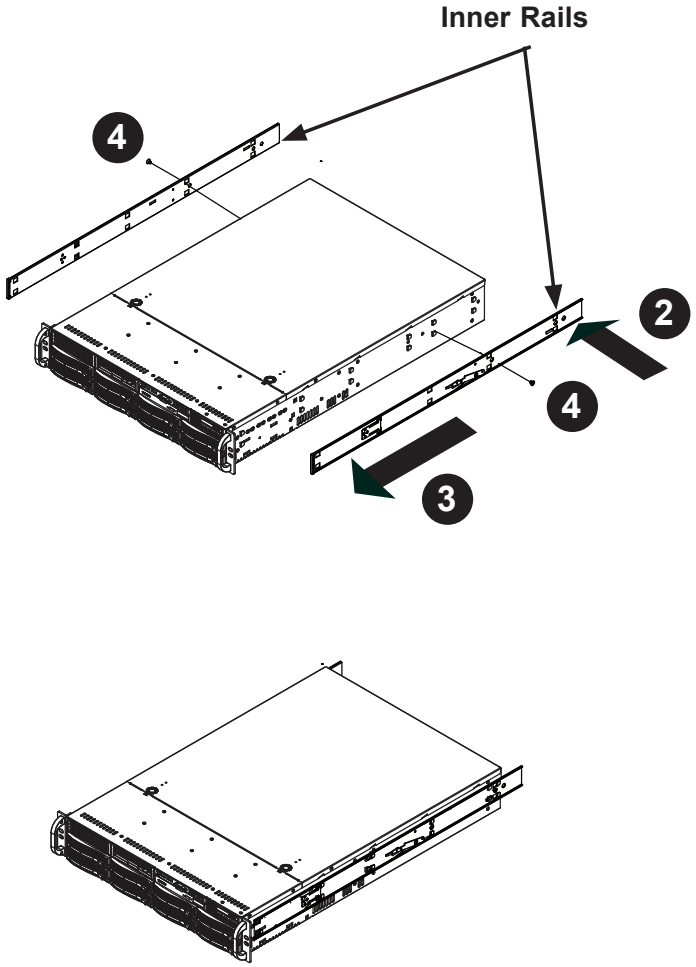
2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis until the rail clicks into the locked position, which secures the inner rail to the chassis.

4. Secure the inner rail to the chassis with the screws provided.

5. Repeat steps 1 through 4 above for the other inner rail.

Figure 2-3. Installing the Inner Rails



Installing the Outer Rails on the Rack

Installing the Outer Rails

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

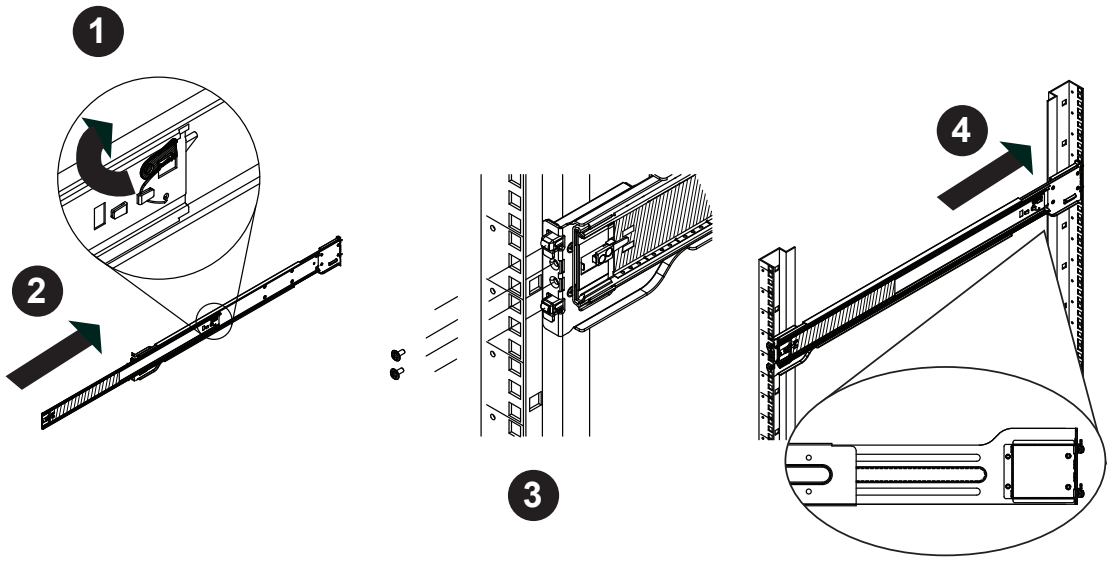
3. Hang the hooks of the front of the outer rail onto the slots on the front of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.

4. Pull out the rear of the outer rail, adjusting the length until it fits within the posts of the rack.

5. Hang the hooks of the rear portion of the outer rail onto the slots on the rear of the rack. If necessary, use screws to secure the rear of the outer rail to the rear of the rack.

6. Repeat steps 1-5 for the remaining outer rail.

Figure 2-4. Extending and Releasing the Outer Rails



Installing the Chassis into a Rack

1. Confirm that the inner rails are properly installed on the chassis.

2. Confirm that the outer rails are correctly installed on the rack.

3. Pull the middle rail out from the front of the outer rail and make sure that the ball-bearing shuttle is at the front locking position of the middle rail.

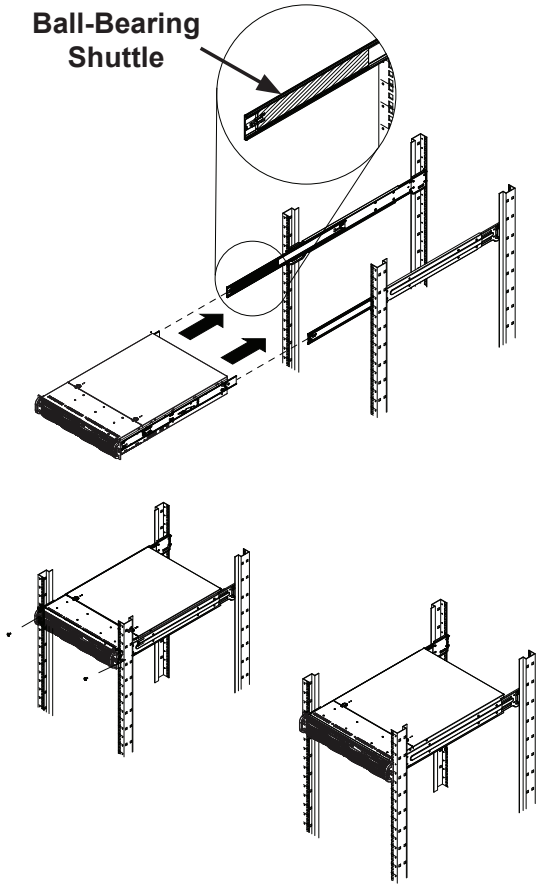
4. Align the chassis inner rails with the front of the middle rails.

5. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides, until the locking tab of the inner rail clicks into the front of the middle rail, locking the chassis into the fully extended position.

6. Depress the locking tabs of both sides at the same time and push the chassis all the way into the rear of the rack.

7. If necessary for security purposes, use screws to secure the chassis handles to the front of the rack.

Figure 2-5. Installing into a Rack



Optional Quick Installation Method

The following quick installation method may be used to install the chassis into a rack.

1. Install the whole rail assembly onto the rack as described on page X-7.

2. Release the inner rail without retracting the middle rail.

3. Install the inner rails on the chassis as previously described on page X-6.

4. Install the chassis onto the middle rail as described in the previous section.

2-5 Checking the Configuration

After setting up the the system, you will need to open the unit to make sure the various boards are properly installed and all the connections have been made.

Accessing the Inside of the System

1. If rack mounted, first release the retention screws that secure the unit to the rack.

2. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

3. There are two screws that secure the cover to the chassis - remove these first.

4. Locate the latch on the top (side if tower) of the chassis - depress where it says "push" then lift the latch to release the cover.

5. Lift the cover from the chassis to gain full access to the inside of the server.

Checking the Components and Setup

1. You may have processors already installed into the CPU boards. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

2. Your server may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SATA drives and backplane have been properly installed and all connections have been made.

Checking the Drives

1. All drives can be accessed from the front of the server. For servicing the peripheral drives, you will need to remove the top/left chassis cover. The SATA disk drives can be installed and removed from the front of the chassis without removing any chassis covers.

2. To install components into the 5.25" drive bays, you must first remove the top/left chassis cover as described in the previous section. Refer to Chapter 6 for details.

3. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SATA drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four hot-swap 9-cm chassis fans working in conjunction with four air shrouds. Two 9-cm exhaust fans are also mounted at the rear of the chassis. The system component layout was carefully designed to promote sufficient airflow through the chassis.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans. Keep this in mind when you reroute them after working on the system.

Supplying Power to the System

The last thing you must do is to provide input power to the system.

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

3. Depress the power on button on the front of the chassis.

Notes

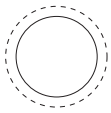
Chapter 3

System Interface

3-1 Overview

There are several LEDs on two control panels as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. The main power and reset buttons are also located on the control panel. Two USB ports are also included for easy front-side access.

3-2 Control Panel Buttons



Reset

The reset button reboots the system.

Power

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the chassis has several LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take

Power Fail

Indicates a power supply module has failed. The backup power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing the power supply. This LED should be off when the system is operating normally.

Overheat/Fan Fail:

When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

NIC1

Indicates network activity on the LAN1 port when flashing.

NIC2

Indicates network activity on the LAN2 port when flashing.

HDD

Indicates IDE channel activity, SATA drive and/or peripheral drive activity (if installed) when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Drive Carrier LEDs

Each drive carrier has two LEDs:

- **Green:** This LED will blink on and off to indicate read/write activity to the hard drive.

- **Red:** A steady red LED indicates a drive failure. If one of the drives fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives. If this LED flashes ~ once per second (1 Hz) it indicates RAID rebuilding activity.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5086B-TRF from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the baseboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system. The unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).

- Baseboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the 5086B-TRF clean and free of clutter.

- The 5086B-TRF weighs approximately 176 lbs (80 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

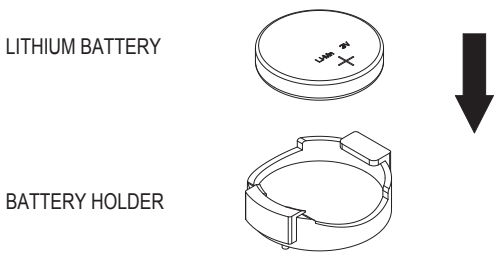
- Put any PCI boards and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the baseboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5086B-TRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Setup

This chapter provides detailed information on the X8OBN-F baseboard and the boards that install into it. All jumpers and connections are described. A layout and quick reference chart are also included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the board to better cool and protect the system.

5-1 Handling the Baseboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the baseboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the baseboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the baseboard.

5-2 Component Installation

The 5086B-TRF has a unique design that sets it apart from most server systems. Processors are installed into four CPU boards, which are installed to a baseboard and connect to each other with bridge boards. The following procedures should be followed in order to access the system to add or change the system's processors and memory. Follow these steps in reverse order when installing the boards back into the system.

Begin by completely shutting down power to the system, including unplugging the AC power cables. Then remove the chassis' top cover, which is secured to the chassis with a single screw at the rear.

Removing a Bridge Module from the Chassis

1. Loosen the screws on the bridge board bracket.

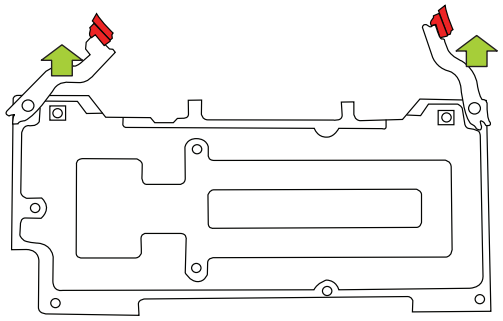
2. Use even pressure to pull the bridge module out of the CPU modules.

Removing a CPU Module from the Chassis

1. Locate the red latches on the handles of the CPU module and place both hands on the handles.

2. Using your thumbs, press both red latches outwards (towards the ends of the board) to release the handles from their locked position.

3. Pull both handles of the CPU board upwards and gently lift the CPU module out of the chassis. Do not grasp the middle of the CPU module to pull it out.



Note. All graphics and images are for illustration purposes only and may be slightly different from the hardware in your system.

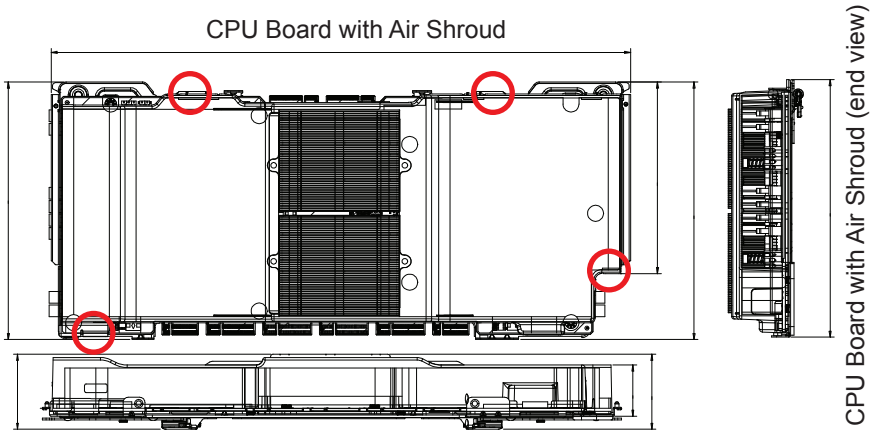
Removing an Air Shroud from a CPU Module

Each CPU board has its own air shroud, which must be removed before installing processors or memory and re-attached before the CPU board is installed back into the baseboard.

1. Each air shroud has four hooks at the corners that secure it to the CPU board.

2. Locate and release the hooks from either edge of the CPU board.

3. Lift the air shroud up and off of the CPU board.

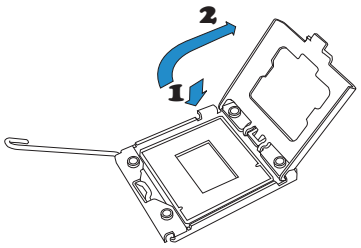


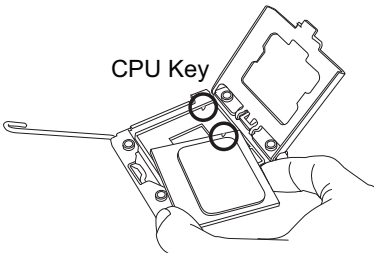
CPU Board with Air Shroud (side view)

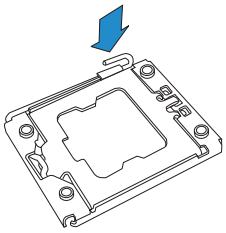
Installing a CPU to the CPU Board

The CPU board bracket that the CPU board is attached to does not present a flat surface for installing CPUs and memory. For this reason, you should lay the board either on a smaller support surface or on the edge of the table so that the board bracket handles do not touch the surface the board bracket is resting on.

1. Press the socket clip down to unlock it. Gently lift the socket clip to open the load plate.
2. Align the CPU key with the socket key.
3. Align CPU Pin 1 against socket pin 1. Once they are aligned, lower the CPU down to the socket.
4. Once the CPU is fully seated on the socket, press the socket clip down to lock it.



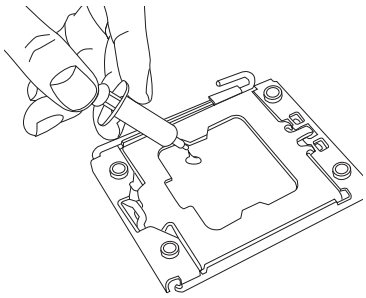




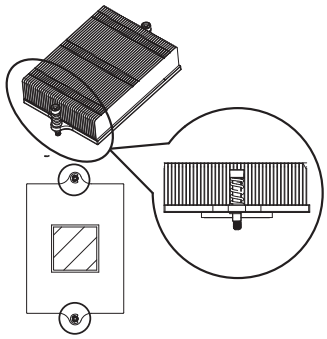
Do not rub the CPU pins against the socket, which may damage the CPU socket.

Installing a CPU Heatsink to the CPU

1. If needed, apply a thin layer of thermal grease to the CPU.
2. Place the heatsink on top of the CPU so that the two mounting holes on the heatsink are aligned with those on the retention mechanism.



3. Insert the two push-pins on the sides of the heatsink through the mounting holes on the CPU board, and turn the push-pins clockwise to lock them evenly.



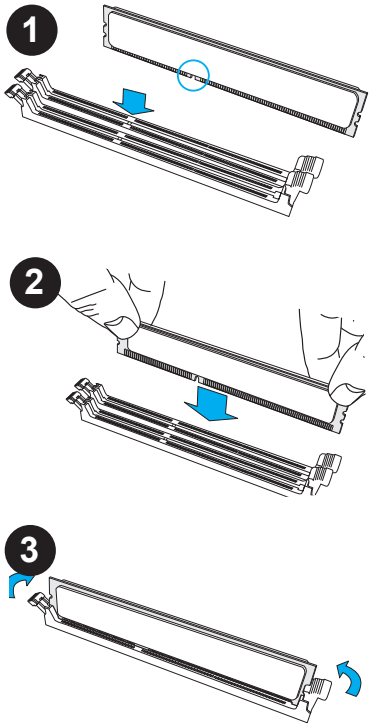
Installing Memory on the CPU Board

The CPU board bracket that the CPU board is attached to does not present a flat surface for installing CPUs and memory. For this reason, you should lay the board either on a smaller support surface or on the edge of the table so that the board bracket handles do not touch the surface the board bracket.

1. Align the key on the DIMM with the key on the DIMM socket.

2. Insert the DIMM straight down and into the DIMM socket by pressing both ends of the DIMM at the same time.

3. Press the tabs on the ends of the DIMM socket inwards to lock the DIMM Into place.



Note: make sure the tabs on all DIMM sockets are pushed inwards regardless of whether memory has been installed or not. Otherwise they might interfere with installing the CPU board back into the chassis.

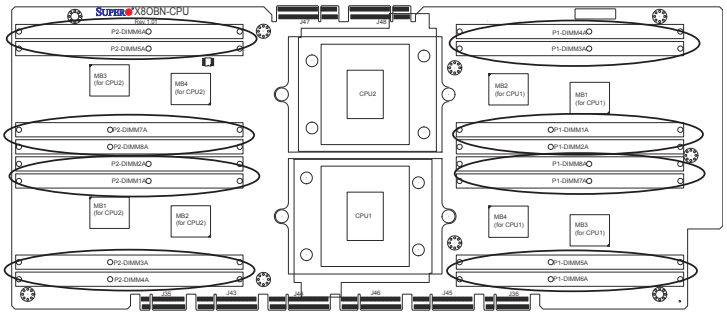
Memory Support

Each X8OBN-F CPU board supports up to 512 GB of registered ECC DDR3-1066 memory in 16 DIMM slots for a total of 2 TB of system memory.

Processor & Memory Module Population Configuration

For memory to work properly, refer to the tables below.

CPUs and their Corresponding DIMM Slots (on each CPU board)								
CPU#	**Corresponding DIMM Slots**							
CPU 1	P1-1A	P1-2A	P1-3A	P1-4A	P1-5A	P1-6A	P1-7A	P1-8A
CPU2	P2-1A	P2-2A	P2-3A	P2-4A	P2-5A	P2-6A	P2-7A	P2-8A



Processor and Memory Module Population (on each CPU board)	
Number of CPUs & DIMMs	**CPU and Memory Population Configuration Table (For memory to work properly, please install DIMMs in pairs.)**
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A
2 CPUs & 10~16 DIMMs	CPU1/CPU2 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + Any memory pairs in P1, P2 DIMM slots

Note: To optimize system performance, we recommend a 4 or 8 CPU configuration as shown in the table below. Please note that a single CPU configuration has not been validated by SMC.

CPU Configuration		
4 CPU Configuration	2 CPUs per CPU Board	Two CPU boards required: installed to CPU board slots 1 and 2 on the base board.
8 CPU Configuration	2 CPUs per CPU Board	Four CPU boards required: installed to all CPU board slots on the base board (1 through 4).

Installing a CPU Board to the Baseboard

After populating the CPU board with the desired components and reinstalling the air shroud, you must install the CPU module to the baseboard.

1. Locate the CPU board slots on the X8OBN baseboard.

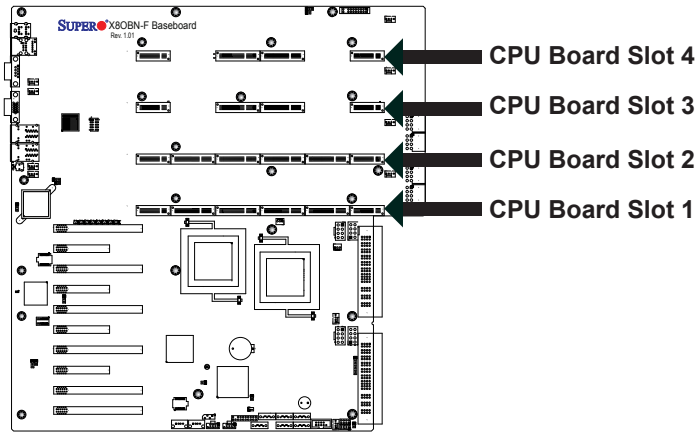
2. Using both hands, grab the two handles on the CPU module keeping the CPU bracket facing toward the PCI-E slot area.

3. With the back plate (marked "Front") toward the left side of the chassis, align the edge of the CPU board bracket with the guide rails, which are located on the middle fan bracket and the rear of the chassis.

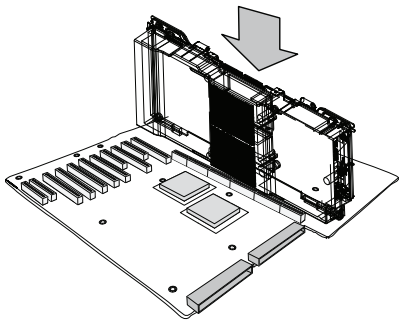
4. Insert the CPU module into the guide rails until the bottom of the CPU board contacts the top of the CPU board slot. The gold fingers at the bottom of the board should contact the slots at the same time that the handles touch the frame.

5. Make sure the notch on each of the latches has entered the frame, then press both handles inward to close them. Gently push the CPU board into the slot until it is fully seated.

6. Press the red latches on the handles inward to lock the handles on the CPU board bracket, which will secure the CPU module in place.



X8OBN Baseboard



CPU Module Locked in Place

If the CPU modules are not properly installed, the CPUs may sustain damage after powering on the system.

Installing a Bridge Module

Bridge boards are used to connect a pair of CPU boards installed in Slots 1 & 2 and/or Slots 3 & 4. (No bridge board is needed between Slots 2 and 3.)

To install the bridge module between the CPU boards, follow the steps below:

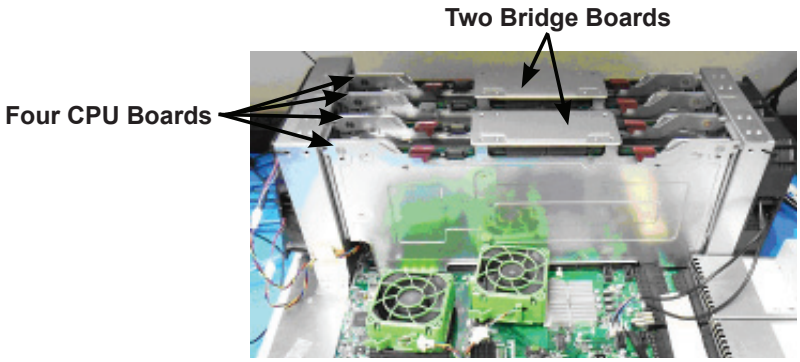
1. Place the bridge module on top of the two CPU boards, making sure that the slot on the bridge board aligns with the gold fingers of the CPU boards. The bridge board bracket is marked "Front" to indicate the correct orientation.

2. Press evenly on all sides of the module to fully seat the bridge board. Double check to make sure that the bridge module is aligned horizontally after installation.

3. After installing both bridge modules, check that they are properly installed by visually sighting along their length to make sure both are completely flat and positioned below the rear chassis lip.

4. Secure the bridge module by tightening all four screws.

Figure 5-1. Installing a Bridge Module



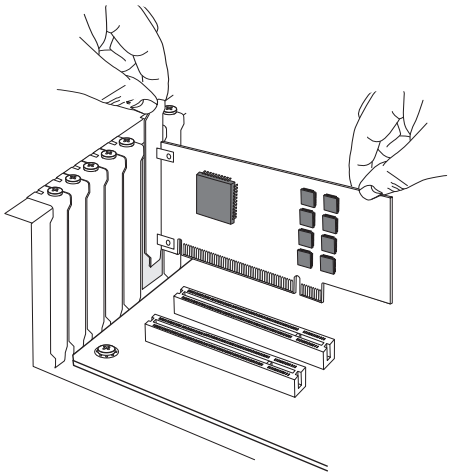
5-3 Installing PCI Add-On Cards

The 5086B-TRF can accommodate up to four PCI-E 2.0 x16 and two PCI-E 2.0 x8 cards (in x16 slots) or up to 10 PCI-E 2.0 x8 cards.

The AC plug cage may have to be pulled out when inserting add-on cards into some of the slots:

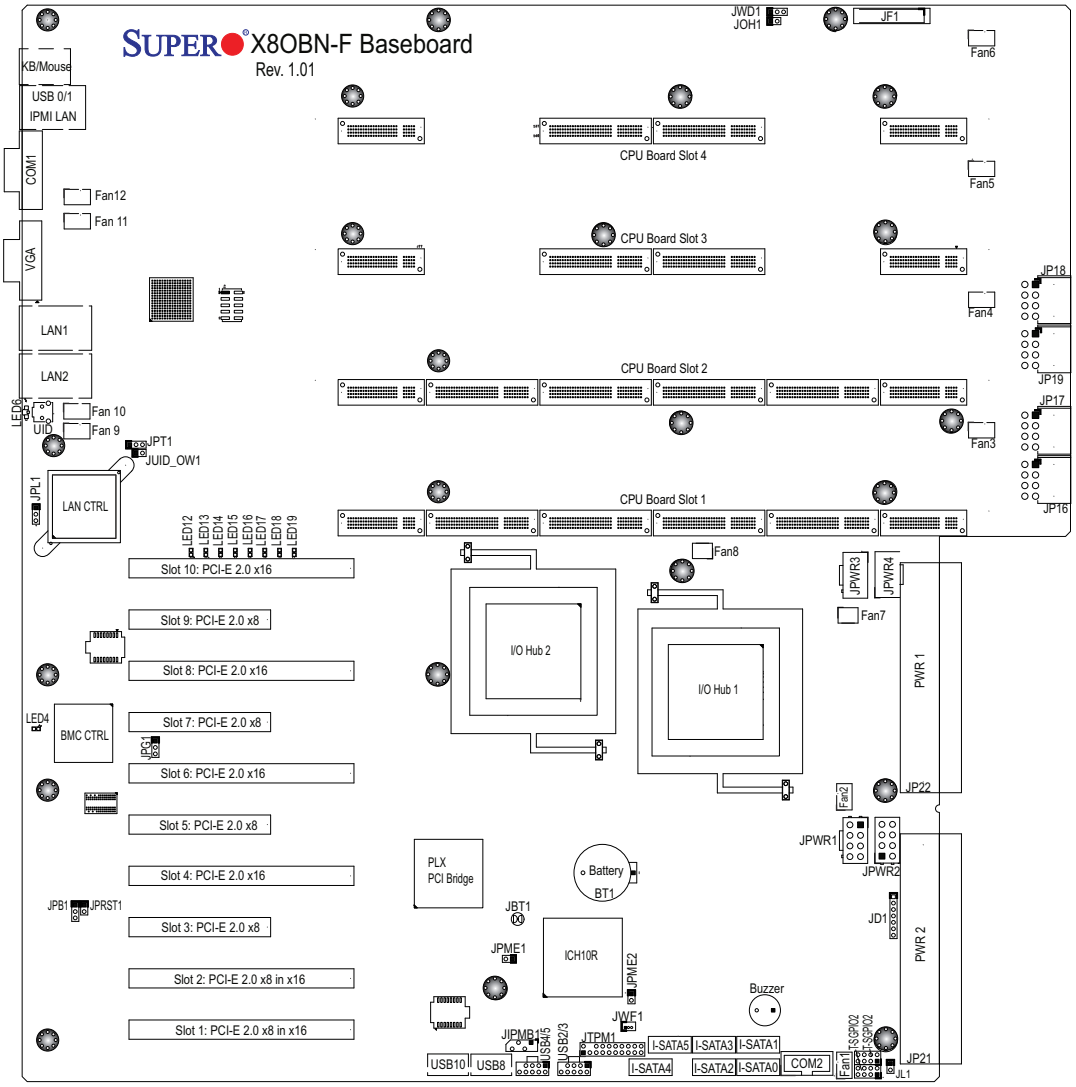
1. Power down the server.
2. Loosen the thumbscrew on the side of the AC socket cage (and the screw on the top if applicable).
3. Push the cage outwards from the chassis until there is enough room to install add-on cards.
4. Install the add cards into the desired slots.
5. Push down with your thumbs evenly on both sides of the card.
6. Make any necessary connections, then return the AC plug cage back to its original position and secure it with the screws that were removed earlier.
7. Power up the server.

Figure 5-2. Installing Add-on Cards



5-4 Baseboard Details

Figure 5-3. X8OBN-F Layout
(not drawn to scale)



Note: Jumpers not indicated are for test purposes only and should not have their settings changed.

X8OBN-F Baseboard Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-6
JPB1	BMC Enabled	Pins 1-2 (Enabled)
JPG1	VGA Enabled	Pins 1-2 (Enabled)
JPME1	ME Mode Recovery	Open (Normal)
JPME2	ME Mode Select	Open (Normal)
JPL1	GLAN1/GLAN2 Enable	Pins 1-2 (Enabled)
JPRST1	BMC Reset	Open (Normal)
JPT1	TPM Enabled	Pins 1-2 (Enabled)
JUID_OW1	UID Overwrite	Open (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
Fan1~6, 9~12	4-pin System Fan Headers (Fan1/Fan2, Fan9~Fan12) and CPU Board Fan Headers (Fan3~Fan6)
Buzzer	Onboard Speaker
CPU Board Slots 1~4	CPU Board Slots 1~4 (for CPU boards)
COM1/COM2	Serial Port/Header
I-SATA 0~5	SATA Ports
JD1	Speaker/Power LED Indicator
JF1	Control Panel Header
JIPMB1	External BMC I^2C Header (for IPMI Card)
JL1	Chassis Intrusion Header
JOH1	Overheat/Fan Fail LED
JP16~JP19	HDD Power Connectors
JP21/JP22	Main Power Supply Connectors (JP22: PWR1, JP21: PWR2)
JPWR1~JPWR4	8-Pin GPU Power Connectors
JTPM1	TPM (Trusted Platform Module) Port 80 Header
JWF1	SATA DOM (Device On Module) Power Connector
KB/MOUSE	Keyboard/Mouse Ports
LAN1/LAN2	G-bit Ethernet Ports 1/2
(IPMI) LAN	IPMI Dedicated LAN
T-SGPIO 1/2	Serial Link General Purpose I/O Headers
USB 0/1	Back Panel USB 0/1 Ports
USB 2/3, 4/5, 8, 10	Front Panel Accessible USB Headers
UID Switch	UID (Unit Identifier) Switch

5-5 Connector Definitions

Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro's server chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	3.3V
16	PWR LED

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

Pin#	Definition
13	3.3V Standby
14	HD Active

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for the LAN1 port is located on pins 11 and 12 of JF1 and the LED connection for the LAN2 port is on pins 9 and 10. Attach NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

NIC1/2 LED Pin Definitions (JF1)

Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED

Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to the OH/ Fan Fail/FP UID connection on pins 7 and 8 of JF1 to provide advanced warnings of a chassis overheat or fan failure. This also works as the front panel UID LED indicator. The red LED takes precedence over the blue LED by default. Refer to the table on the right for pin definitions.

OH/Fan Fail/PWR Fail/UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Red+ (Blue LED Cathode)
8	Blue+ (OH/Fan Fail/PWR Fail/ UID LED)

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer chassis. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button with a setting in BIOS (see Chapter 5). To turn off the power when the system is set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	Ground

Power Connectors

Two main power supply connectors (JP21/JP22), four 8-pin GPU power connectors (JPWR1/JPWR2/JPWR3/JPWR4), and four HDD power connectors (JP16~JP19) are located on the X8OBN baseboard. These power connectors meet the SSI EPS 12V specification. JP21 and JP22 must be connected to your power supply to provide adequate power to your system and components. Failure to do so will void the manufacturer warranty on your power supply and the system. See the table on the right for pin definitions.

GPU Power Connector Pin Definitions

Pins	Definition
1~3	+12V
4~8	GND

(GPU PWR cables required for graphics cards)

HDD Power Connector Pin Definitions

Pins	Definition
1~4	GND
5/6	+12V
7/8	+5V

(HDD PWR cable required for HDDs)

DOM Power Connector

A power connector for SATA DOM (Disk On Module) devices is located at JWF1. Connect the appropriate cable here to provide power support for a DOM device.

DOM PWR Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground

Fan Headers

The X8OBN baseboard has six system fan headers and four CPU card fan headers. All these are 4-pin fans and are backward compatible with traditional 3-pin fans. In addition, two 3-pin IOH fan headers are located at Fan1 and Fan2. Fan speed control is available for 4-pin fans only.* See the tables on the right for more information.

*Fan speed control is available via Hardware Health Monitoring in the Advanced Section of BIOS.

Fan Headers

Fan Type	# of Pins	Q'ty	Fan No.
IOH Fans	3-pin Fan	2	Fan7 (IOH1)/ Fan8 (IOH2)
CPU_ Board Fans	4-pin Fan	4	Fans 3~6
System Fans	4-pin Fan	6	Fan1/Fan2, Fans 9~12

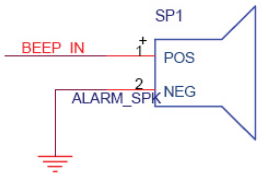
Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation (4-pin fans only)

Onboard Speaker

The onboard speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions.

Onboard Speaker Pin Definition		
Pin#		Definitions
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker



Power LED/Speaker

On the JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are for use with an external speaker. If you wish to use the onboard speaker, close pins 6-7 with a cap.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Onboard Speaker

TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM and Port 80 support, which will enhance system performance and data security. See the table on the right for pin definitions.

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

T-SGPIO 1/2 Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers are located on the baseboard. These headers support Serial_Link interface for onboard SATA connections. See the table on the right for pin definitions.

T-SGPIO Pin Definitions

Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

NC = no connection

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the baseboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion condition when the chassis is opened.

Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground

Overheat LED/Fan Fail

The JOH1 header is used to connect an LED indicator to provide warning of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

Overheat LED Pin Definitions

Pin#	Definition
1	5vDC
2	OH Active

OH/Fan Fail LED Status

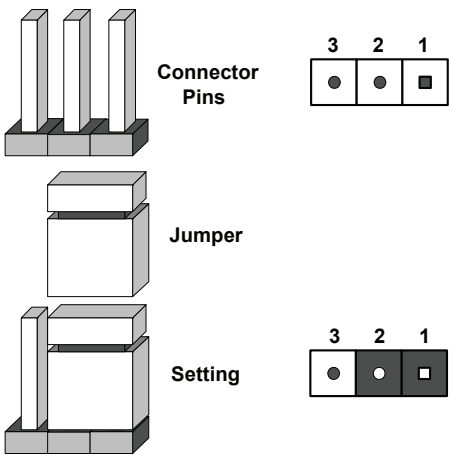
State	Message
Solid	Overheat
Blinking	Fan Fail

5-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the baseboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the baseboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1 and LAN2 Ethernets ports. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings (JPL1)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

Jumper JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

BMC Enable

Jumper JPB1 allows you to enable the embedded BMC (Baseboard Management) controller to provide IPMI 2.O/ KVM support on the serverboard. See the table on the right for jumper settings.

BMC Enable Jumper Settings

Jumper Setting	Definition
Pins 1-2	BMC Enable
Pins 2-3	Normal (Default)

BMC Reset

Use Jumper JPRST1 to reset the BMC settings on the serverboard. See the table on the right for jumper settings.

BMC Reset Jumper Settings

Jumper Setting	Definition
Closed	BMC Reset
Closed	Normal (Default)

TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support, which will enhance data integrity and system security. See the table on the right for jumper settings. The default setting is enabled.

Note: For more information on IPMI configuration, please refer to the WPCM 450 IPMI BMC User's Guide posted on our Website @ http://www.supermicro.com.

TPM Support Enable Jumper Settings

Jumper Setting	Definition
1-2	Enabled
2-3	Disabled

ME Recovery

Close jumper JPME1 to use ME Firmware Recovery mode, which will limit system resources for essential functionality use only without putting restrictions on power use. In single operation mode, an online upgrade will be available via Recovery mode. See the table on the right for jumper settings.

ME Recovery Select Jumper Settings

Jumper Setting	Definition
Open	Normal (Default)
Closed	Manufacture Mode

JUID_OW1 (UID_Overwriting)

When the jumper JUID_OW1 is set to Off (default), the red LED (Overheat/Fan Fail/PWR Fail/UID LED) located on pin 8 of JF1 will take precedence over the blue UID_LED located on pin 7 of JF1. In this case, when the red LED is on, the blue LED will be turned off. When the red LED is off, the blue UID_LED can be on or off. In other words, the red LED signal overwrites the blue UID_LED signal if J_UID-OW is set to off. When the jumper J_UID_OW is On, the red LED (OH/Fan Fail/PWR Fail/UID LED) and the blue_UID_LED work independently of each other. The red LED will have no effect on the blue LED. See the table on the right for jumper settings.

UID_Overwriting Jumper Settings

Jumper	Definition
Off	Red OH/Fan Fail/PWR Fail LED (pin 8 of JF1) takes precedence over (overwrites) the blue UID_LED (pin 7 of JF1). Red LED: On, Blue LED: Off, Red LED: Off, Blue LED: On or Off
On	Red LED (OH/Fan Fail/PWR Fail LED) and the blue UID_ LED function independently. The red LED does not overwrite the blue LED. The red LED has no effect on the blue_UID LED Red LED: On, Blue LED: On,Off Red LED: Off, Blue LED: On, Off

Manufacturer Mode Select

Close this jumper (JPME2) to bypass SPI flash security and force the system to use the Manufacturer Mode, which will allow you to flash the system firmware from a host server to modify system settings. See the table on the right for jumper settings.

ME Mode Select Jumper Settings	
Jumper Setting	Definition
Open	Normal (Default)
Closed	Manufacture Mode

5-7 Onboard Indicators

LAN LEDs

The Ethernet ports (located on the I/O backplane) have two LEDs. On each port: the yellow LED flashes to indicate activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI Dedicated LAN LEDs

In addition to LAN1/LAN2, a dedicated IPMI LAN is also located on the I/O backplane. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.

IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active

Rear UID LED

The rear UID LED is located at LED6 on the backplane. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service. Refer to UID Switch on Page 3-15 for more information.

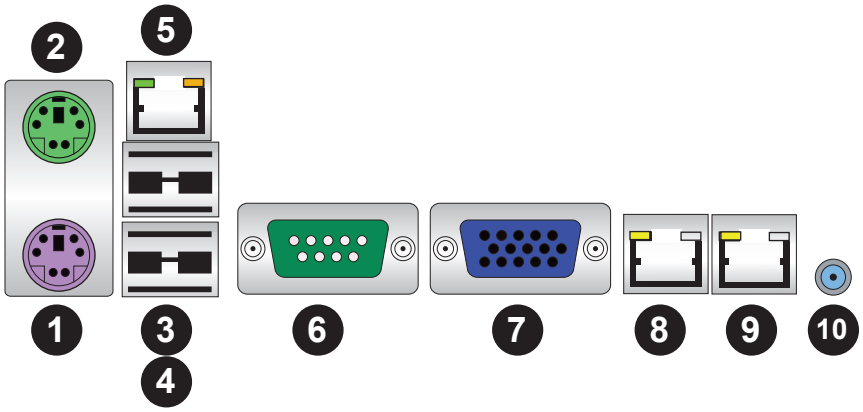
UID LED Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

BMC Heartbeat LED

A BMC Heartbeat LED is located at LED4 on the baseboard. When this LED is blinking, the BMC is functioning normally. See the table at right for more information.

BMC Heartbeat LED Status	
Color/State	Definition
Green: Blinking	BMC: Normal

5-8 I/O Ports



Rear I/O Ports	
1. Keyboard	6. COM1 Port
2. PS/2 Mouse	7. VGA Port
3. USB0	8. LAN1 Port
4. USB1	9. LAN2 Port
5. Dedicated IPMI LAN	10. UID Button

5-9 Serial ATA Connections

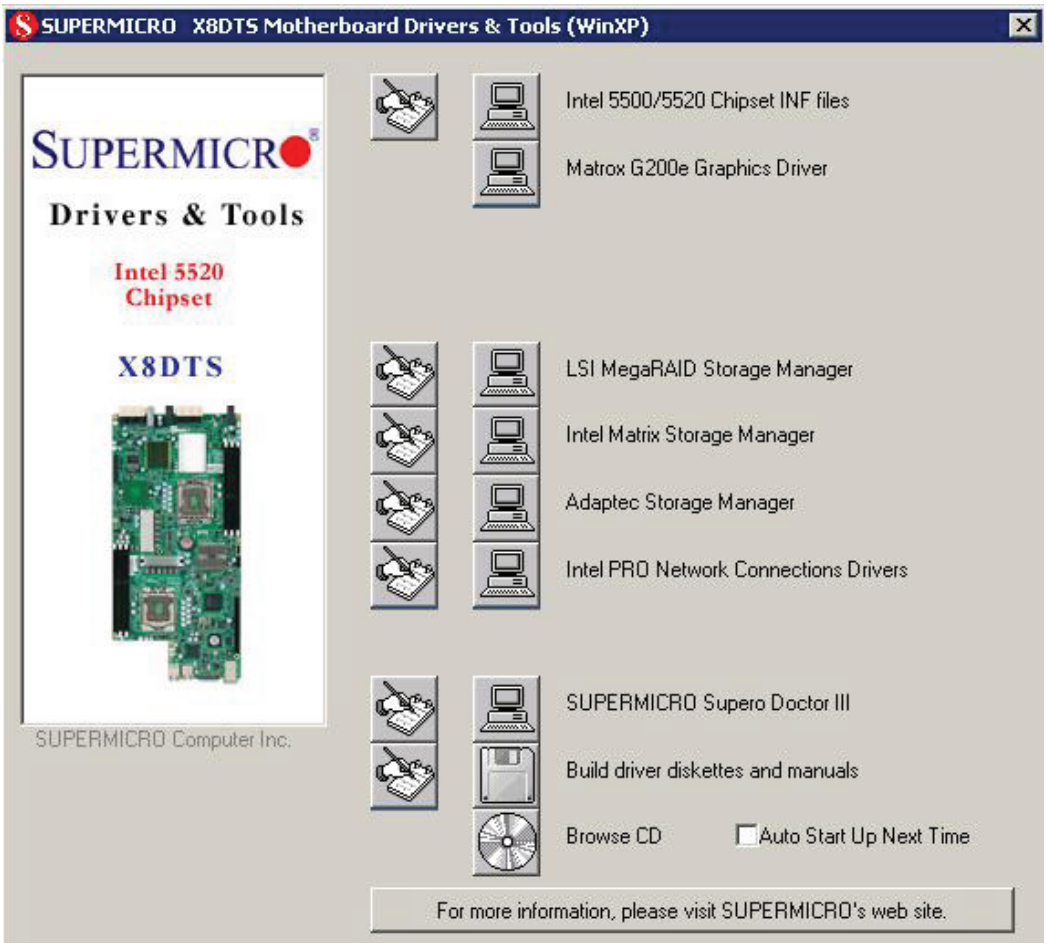
Serial ATA Ports

There are six Serial ATA Ports (I-SATA0~I-SATA5) located on the X8OBN-F. These ports, supported by the Intel ICH10R South Bridge, provide serial-link signal connections, which are faster than Parallel ATA. See the table on the right for pin definitions.

Serial_ATA Pin Definitions	
Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

5-10 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your serverboard.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

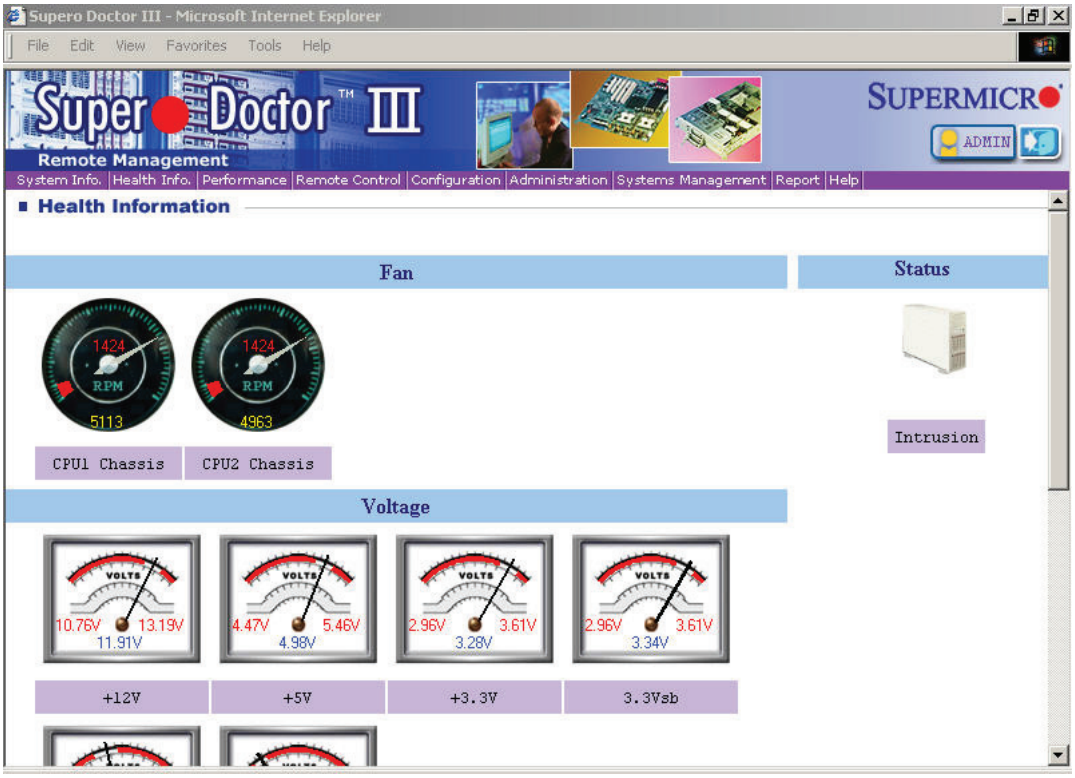
SuperDoctor III

The SuperDoctor III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your serverboard allows you to monitor the environment and operations of your system. SuperoDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperoDoctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

SuperDoctor III Interface Display Screen (Health Information)



SuperDoctor III Interface Display Screen (Remote Control)

Note: SuperDoctor III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we will recommend using Supero Doctor II.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC758 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

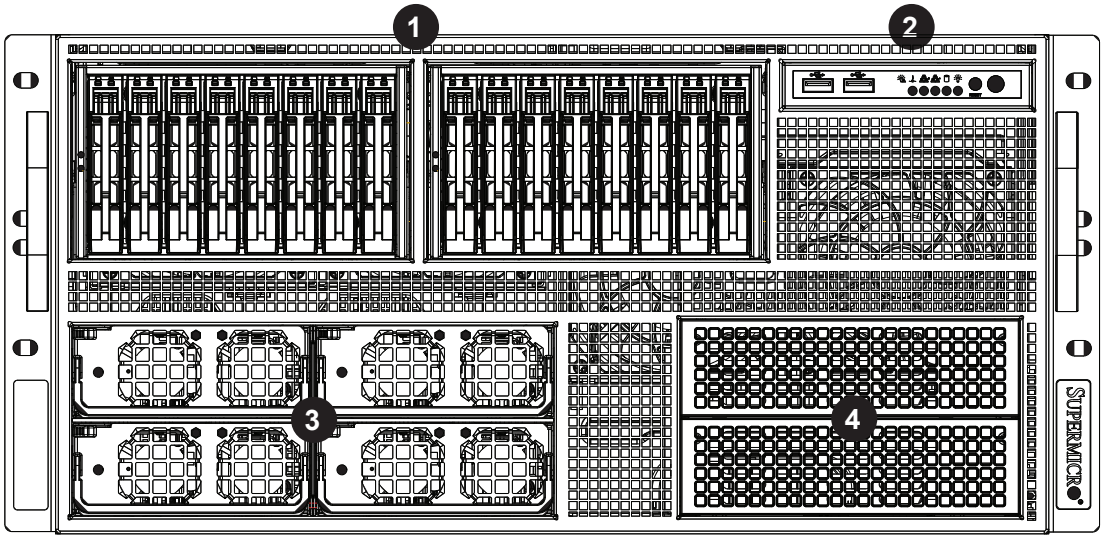
Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

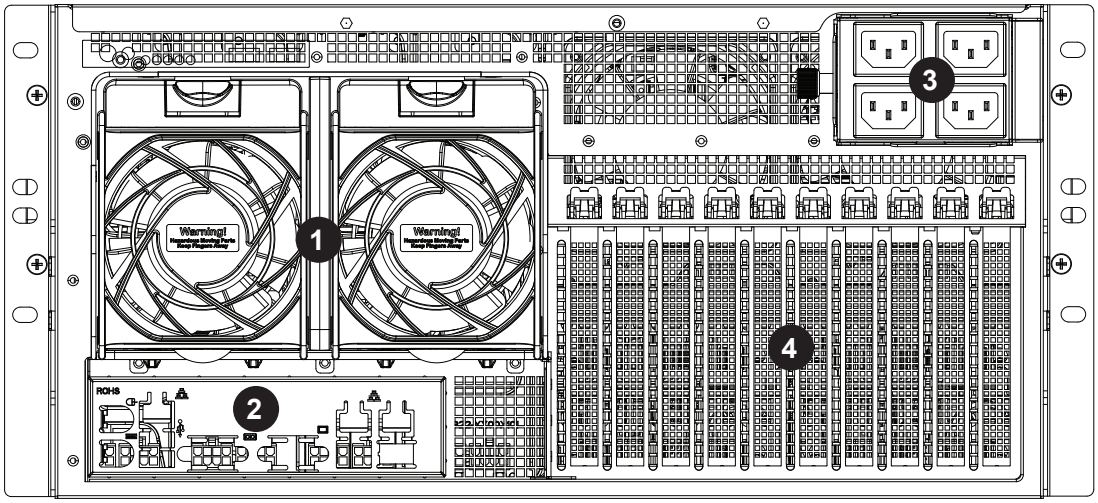
Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Front and Rear Chassis Views



Front Chassis Features	
1. Hot-swap Drive Bays	3. Power Supply Modules
2. Control Panel	4. Peripheral Drive Bays



Rear Chassis Features	
1. 9-cm Exhaust Fans	3. AC Power Sockets
2. I/O Ports (see Chapter 5)	4. Expansion Card Slots

6-2 Control Panel

The control panel is connected to the serverboard through the midplane. The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons.

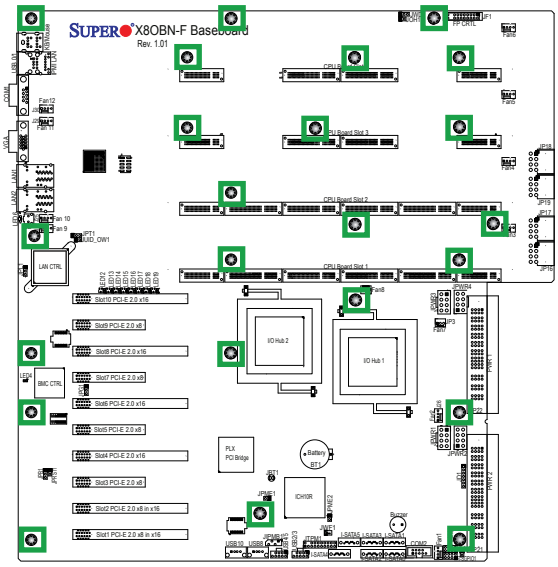
6-3 Installing the Baseboard into the Chassis

Refer to Chapter 5 for instructions on installing components such as CPUs and memory. Follow the instructions below to install the baseboard into the chassis.

Tools Needed

- Phillips Screwdriver
- Pan head #6 screws (23 pieces)
- Standoffs (20 pieces, if needed)

1. First install the IO shield in the chassis.
2. Locate the mounting holes on the baseboard and the matching mounting holes on the chassis.



3. Install standoffs in the chassis as needed.
4. Place the baseboard in the chassis, making sure that the mounting holes on the baseboard match the corresponding mounting holes on the chassis. Also make sure the IO ports are positioned toward the rear of the chassis.
5. Using the Phillips screwdriver, insert a pan head #6 screw into mounting hole on the baseboard and its matching standoff on the chassis. Repeat this step to secure the baseboard to the chassis. It is best to tighten all screws only after they have all been installed.

6-4 System Fans

Four 9-cm cooling fans and two 9-cm exhaust fans provide the cooling for the 5086B-TRF. It is very important that the chassis top cover is properly installed for the cooling air to circulate properly through the chassis.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace the failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the four fans has failed.

Replacing Fans

The system power need not be shut down since the fans are all hot-pluggable.

1. Press the tab on the top of the fan housing of the failed fan and remove the entire housing unit.

2. Replace the failed fan with an identical one (available from Supermicro). Position the new fan at its proper place in the chassis by fitting the fan with its housing onto the fan mounts in the chassis. A "click" can be heard when the fan (in its housing) as been fully inserted.

3. If the system is already powered on, the fan will activate immediately upon being connected.

Figure 6-2. Replacing a Rear Exhaust Fan

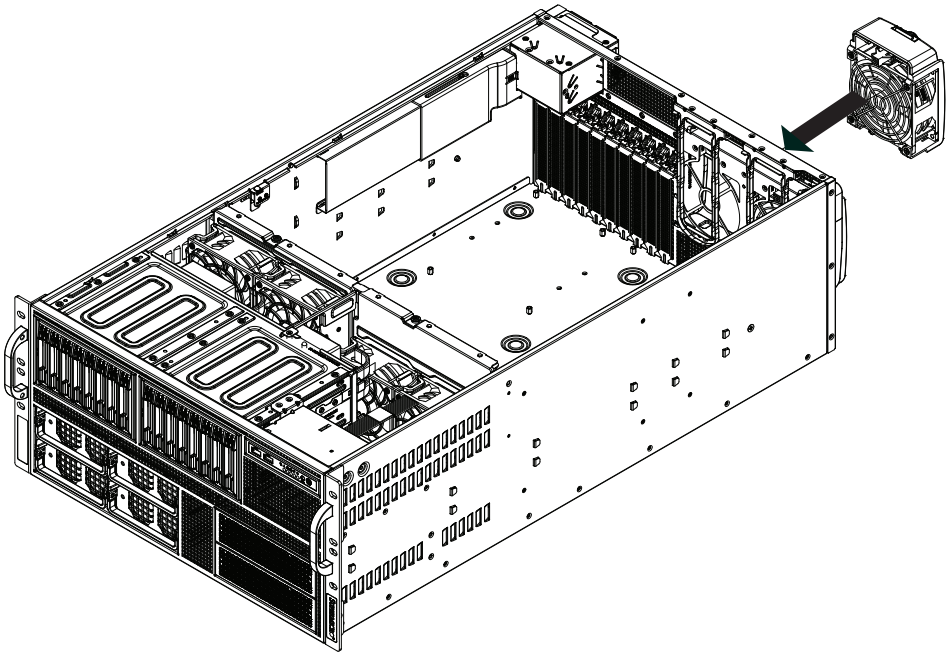
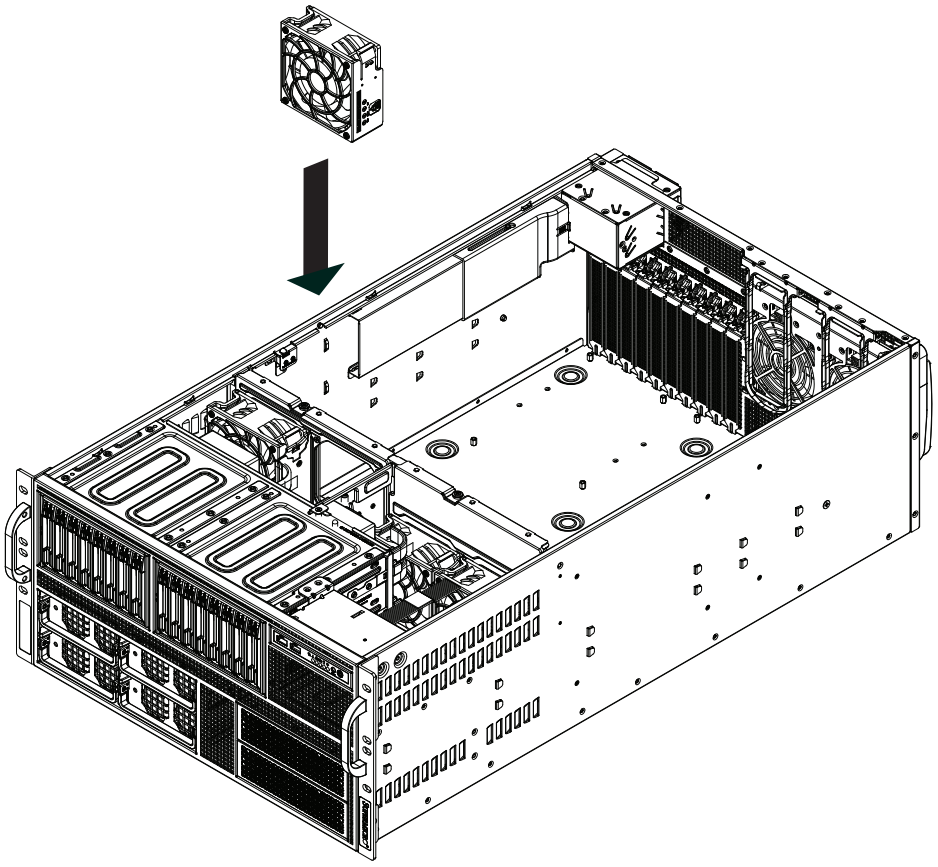


Figure 6-3. Replacing a System Fan



6-5 Drive Bay Installation/Removal

Accessing the Drive Bays

SATA Drives: You do not need to access the inside of the chassis or remove power to replace or swap SATA drives. Proceed to the next step for instructions. You must use 2.5" hard drives.

Hard Drive Midplane

The hard drives plug into a midplane that provides power, drive ID and bus termination. A RAID controller can be used with the midplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the hard drives. The midplane is already preconfigured, so no jumper or switch configurations are required.

SATA Drive Installation

These drives are mounted in drive carriers to simplify their installation and removal from the chassis. The carriers also help promote proper airflow for the drives. For this reason, even empty carriers without hard drives installed must remain in the chassis.

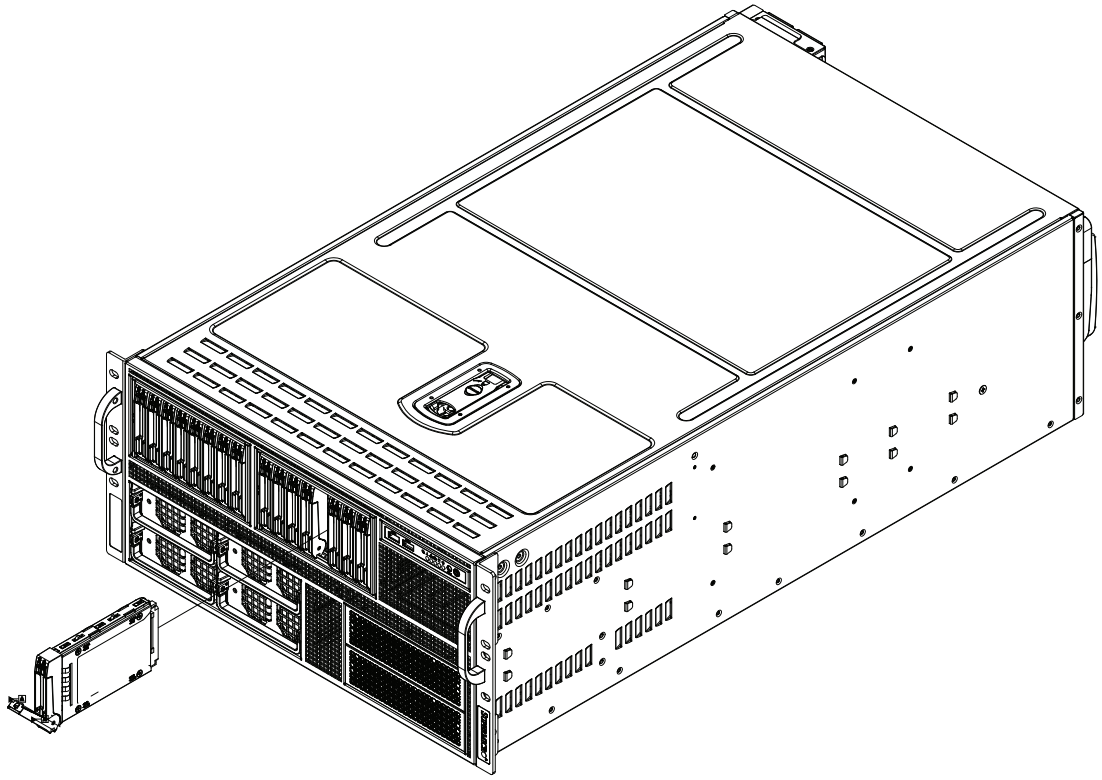
Removing an HDD Carrier from the Chassis (Figure 6-4)

1. Press the release button on the drive tray. This extends the drive tray handle.
2. Use the handle to pull the drive out of the chassis.

Installing a SATA Hard Drive (Figures 6-5 and 6-6)

1. Remove the screws securing the dummy drive to the drive carrier.
2. Remove the dummy drive. Place the carrier on a flat surface.
3. Slide the hard drive into the carrier with the printed circuit board side down.
4. Carefully align the mounting holes in both the drive tray and the hard drive.
5. Secure the hard drive to the tray using the screws provided.
6. Insert the drive carrier into the chassis. Make sure to close the carrier handle to lock the carrier into place.

Figure 6-4. Removing an HDD Carrier from the Chassis



Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/files/storage/SAS-CompList.pdf

Use caution when working around the midplane. Do not touch the midplane with any metal objects and make sure no cables touch the midplane or obstruct the holes, which aid in proper airflow.

Important: Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Figure 6-5. Removing the Dummy Drive from the Carrier

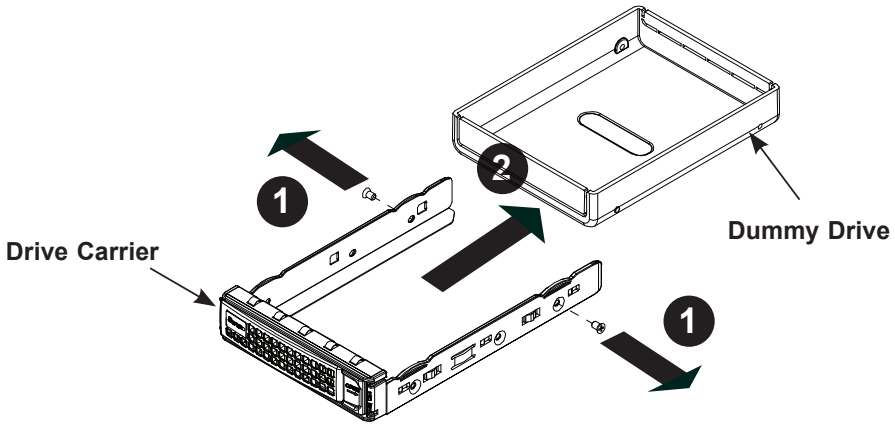
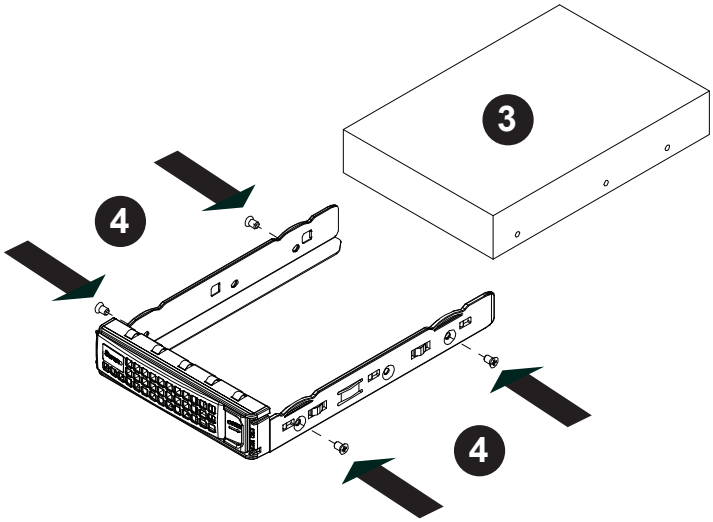


Figure 6-6. Installing a Drive to a Carrier



6-6 Power Supply

The SuperServer 5086B-TRF has a 2800W (2+2) redundant 1400W power supply subsystem of four separate power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

When fully inserted into the chassis, the power supplies connect automatically to a power distribution board (PDB). The PDB in turn connects to the AC power sockets located at the rear of the chassis.

Power Supply Failure

If either of the active power supply modules fail, one of the other modules will take the full load and allow the system to continue operation without interruption. The PWR Fail LED will illuminate and remain on until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro. The power supply units have a hot-swap capability, meaning you can replace the failed unit without powering down the system.

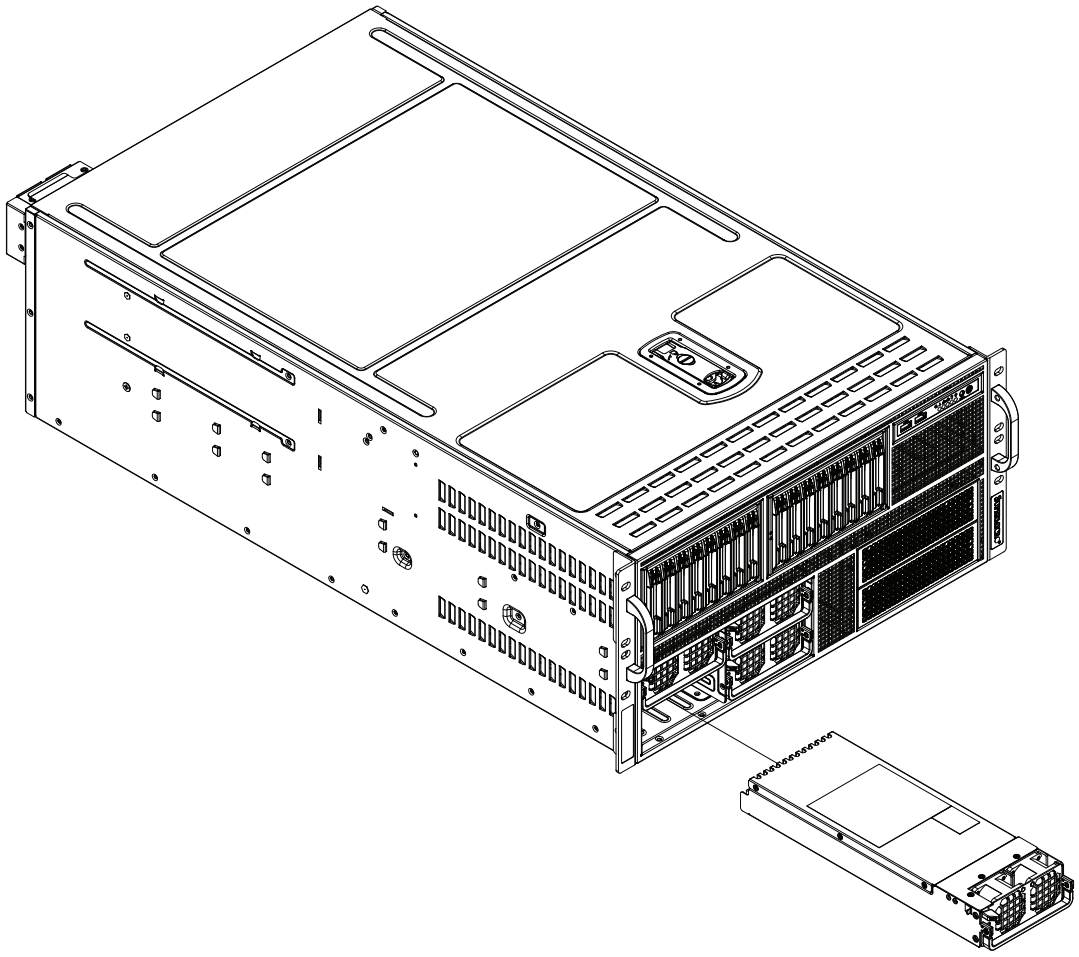
Replacing the Power Supply

You do not need to shut down the system to replace a power supply unit. The backup power supply module will keep the system up and running while you replace the failed hot-swap unit. Replace with the same model (see part number in the Appendix), which can be ordered directly from Supermicro.

Replacing the Power Supply

1. The SC758 chassis includes a redundant power supply subsystem consisting of two active and two backup power modules. The system can continue to operate without shuttng down if you remove only one power supply at a time.
2. Unplug the power supply that you will replace.
3. Push the release tab (on the back of the power supply) as illustrated.
4. Pull the power supply out using the handle provided.
5. Replace the failed power module with the same model.
6. Push the new power supply module into the power bay until you hear a click.
7. Plug the AC power cord back into the module and power up the server.

Figure 6-7. Installing a Power Supply Module



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8OBN-F Baseboard. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility screens.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

Note: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup Utility. This setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

Note: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at http://www.supermicro.com/support/manuals/.

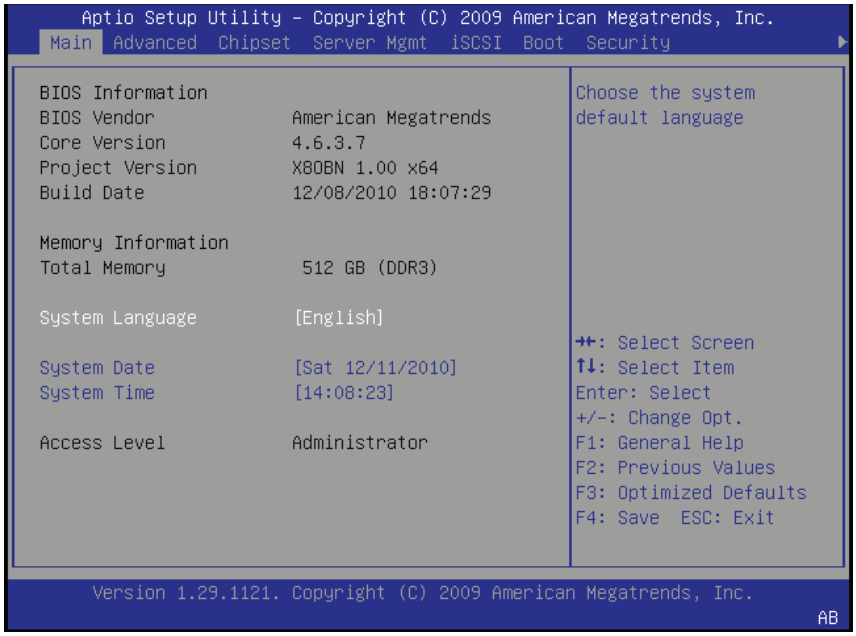
Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



BIOS Information: The following BIOS information will be displayed:

- BIOS Vendor: This item displays the name of the BIOS vendor.
- Core Version: This item displays the version of the BIOS Core currently used in the system.
- Project Version: This item displays the version of the mainboard currently used in the system.

- Build Date: This item displays the date when this BIOS was completed.

Memory Information: The following memory information will be displayed:

- Total Memory: This item displays the size of memory available in the system.

System Language

The feature allows the user to select a language setting for the Setup utility. The default setting is English.

System Time/System Date

These features allow the user to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

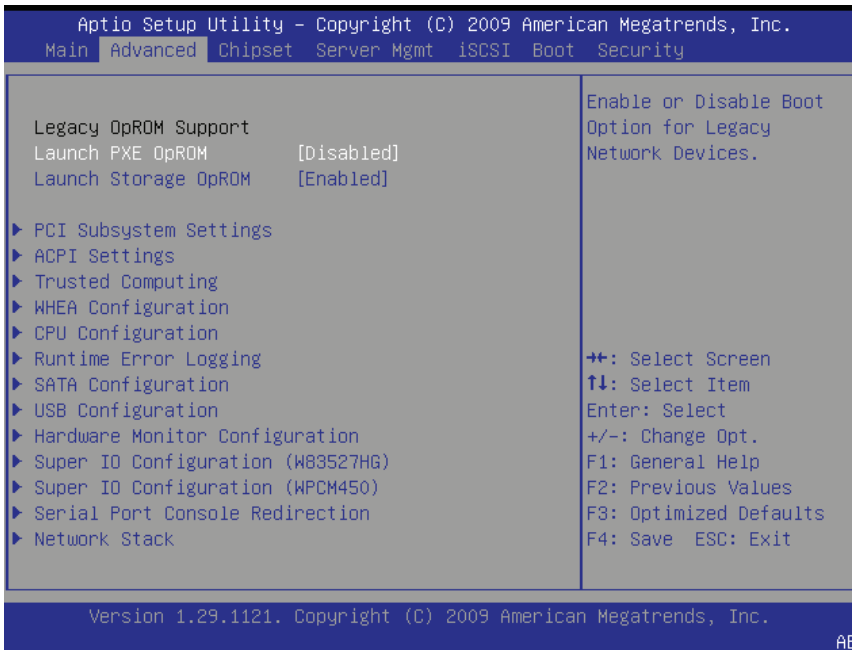
Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

Access Level

The feature displays the privilege level that has been pre-set for the user for accessing the setup utility or the system.

7-3 Advanced Setup Configuration

Use the arrow keys to select the Advanced Setup menu and press <Enter> to access the submenu items.



Legacy OpROM Support

Use this feature to configure Option ROM settings which will allow the system to boot up via a legacy network device.

Launch PXE OpROM

Select Enabled to boot up the system via a legacy network device. The options are Enabled and **Disabled.**

Launch Storage OpROM

Select Enabled to boot up the system via a legacy mass storage device that has the Option ROM capability built in. The options are **Enabled** and Disabled.

▶PCI Subsystem Settings

PCI Bus Driver Version: This feature displays the version number of the PCI Bus Driver used in this system.

PCI ROM Priority

This feature allows the user to specify which PCI Option ROM to use when multiple Option ROMs are installed in the system. The options are Legacy ROM and **EFI (Extensible Firmware Interface)_Compatible ROM**.

Above 4G Decoding

Select Enabled to allow a 64_bit_capable device to be decoded in the address space above 4G if 64-bit_PCI_decoding is supported by the system. The options are Enabled and **Disabled**.

PCI Common Settings

PCI Latency Timer

Select a value to be used by the PCI Latency Timer Register in bus clock calculation. The options are **32 PCI Bus Clocks,** 64 PCI Bus Clocks, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks, and 248 PCI Bus Clocks.

VGA Palette Snoop

If this feature is set to Enabled, a PCI card that does not have its own VGA color palette built-in will detect a video_card palette to mimic it for color scheme support. The options are Enabled and **Disabled**.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

PCI Express Device Settings

Relaxed Ordering

Select Enabled to allow a PCI-E transaction to be completed prior to other transactions that were already enqueued. This violates PCI strict-ordering rules. The options are Enabled and **Disabled**.

Extended Tag

Select Enabled to allow a PCI-E device to use the 8-bit Tag field as a requester. The options are Enabled and **Disabled**.

No Snoop

Select Enabled to enable the "no_snoop bit" for a PCI-E device, which will reduce front_side bus traffic for performance enhancement. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0 to force all PCI-E links to operate at L0 state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0, and Auto.

⚠ **Warning**: Enabling ASPM support may cause some PCI-E devices to fail!

Extended Synch

Select Enabled to generate extended synchronization patters to enhance system performance. The options are **Disabled** and Enabled.

▶ACPI (Advanced Configuration and Power Interface) Settings

This feature allows the user to set Advanced Configuration and Power Interface parameters for this system.

Enable ACPI Auto Configuration

Select Enabled to allow the system BIOS to automatically configure ACPI parameters for the system. The options are **Disabled** and Enabled.

Enable Hibernation

Select Enabled for Hibernation support which will allow a system to enter an OS/S4 state. Hibernation may not be supported by some operation systems. The options are **Enabled** and Disabled.

ACPI Sleep State

Use this feature to set the highest ACPI sleep state when the suspend button is pressed. The options are **S1 (CPU_Stop_Clock)** and Suspend Disabled.

▶Trusted Computing

This feature allows the user to configure Trusting Computing settings.

TPM Configuration

This future allows the user to set Trusted Platform Module Configuration settings.

TPM Support

Select Enabled to enable TPM (Trusted Platform Module) support for system security and data integrity. The options are **Disabled** and Enabled. If this option is set to Enabled, the following items will display.

TPM State

Select Enabled to display the status of TPM support for this system. The options are **Disabled** and Enabled. Please note that a system reboot is needed before a change on the TPM state to take effect.

Pending TPM Operation

This feature is used to schedule a TPM operation that is pending. Select "Enable Take Ownership" to allow the pending TPM operation to take precedence over other operations in the queue and be processed and executed immediately. If the option "Disable Take Ownership" is selected, the pending TPM operation will not take precedence over other operations and will be processed based on the order that are placed in the queue. Select the option "TPM Clear" to delete all pending TPM operations from the queue. If the option "None" is displayed, there is no pending TPM operation in the queue. Please note that a system reboot is needed for any change on the feature to become effective. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

Current TPM Status Information

This feature displays the current status of the TPM items listed below.

TPM Enabled State

Select Enabled to display the status of "TPM Enabled" in this system. The options are **Disabled** and Enabled.

TPM Active State

Select Deactivate to disable TPM support for this system. The options are **Deactivated** and Activate.

TPM Active State

This feature lists the status of the TPM Owner. The default setting is UnOwned which indicates that there is no owner listed for TPM support.

▶WHEA Configuration

This feature allows the user to configure WHEA (Windows Hardware Error Architecture) support settings.

WHEA Support

Select Enabled to enable WHEA support which will provide a common infrastructure for the system to handle hardware errors on the Windows OS platforms in order to reduce system crashes due to hardware errors and to enhance system recovery and health monitoring. The default setting is **Enabled**.

▶CPU Configuration

CPU Configuration

This feature allows the user to configure CPU support settings. It also displays the status of the processor used in the system.

- **Processor Type**: This item displays the CPU type for the mainboard.
- **Physical Processors**: This item displays the number of physical processors used in this system.
- **Logical Processors**: This item displays the number of logical processors available for this system.
- **EMT 64**: This item indicates if EMT 64 (Intel Extended Memory Technology for 64-bit) is supported by this system.
- **Processor Speed**: This item displays the speed of the processor used in the system.
- **Processor Stepping**: This item indicates the revision level of the processor used in the system.
- **Microcode Revision**: This item indicates the revision number of the processor core used in the system.
- **Processor Cores**: This item indicates the number of processor cores available in the system.
- **Intel HT Technology**: This item indicates if Intel Hyper-Threading Technology is supported by the system. Intel TH Technology is used to enhance CPU performance.

Clock Spread Spectrum

Select Enable to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hyper-threading

Select Enabled to use Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Core

Select Enabled to use a processor's second core and beyond. (Please refer to Intel's website for more information.) The options are **All,** 1 and 2.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to launch the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS.)

Execute Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to support Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft web Sites for more information.)

Hardware Prefetcher (Available when supported by the CPU)

If enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

If this item is set to Disabled, the CPU prefetches the cache line for 64 bytes. The CPU prefetches both cache lines for 128 bytes as comprised if this item is set to Enabled. The options are Disabled and **Enabled**.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use Intel Virtualization Technology which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: Please reboot the system for any change in this setting to take effect. Please refer to Intel's website for detailed information.

Power Technology

Use this feature to select power management features for the system. Select Energy Efficient to minimize power use. Select Custom to customize power use settings. The options are Disabled, Energy Efficient and **Custom**.

Intel® EIST Technology

EIST

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel's web site for detailed information. The options are Disabled and **Enabled**.

TurboBo Mode (Available when EIST Tech. is enabled)

Select Enabled to enable Turbo Mode support to boost system performance. The options are **Enabled** and Disabled.

P-STATE Coordination

This feature allows the user to decide how to change a P-State Coordination type. A P-state is the operational state when a processor/core is performing meaningful and useful tasks. The options are **HW_All** (All Hardware-related events), **SW_All** (All Software-related events), and SW_Any (Any Software-related events).

CPU C3 Report (Available when the C-State Tech is enabled)

This feature allows the user to decide at what power state should the CPU treat it as a CPU C3 state and report it to the OS as so. Select ACPI C-2 to report an ACPI C-2 event as a CPU C3 event to the OS. Select ACPI C-3 to report an ACPI C-3 event as a CPU C3 event to the OS. The options are **ACPI-C2**, ACPI-C-3, and Disabled.

Package C-State Limit (Available when the C-State Tech is enabled)

If this package is set to Auto, the AMI BIOS will automatically set a limit on the register of the C-State package. The options are **No Limit**, C0, C1, C3, C6, and C7.

▶Runtime Error Logging

Runtime Error Logging

Select Enabled to support Runtime Error Logging. The options are Enabled and **Disabled**. If this feature is set to Enabled, the following items will display:

PCI Error Logging Support

Select Enabled to enable error logging occurred in PCI/PCI-E connections. The options are Enabled and **Disabled**.

Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for memory correctable errors. The default setting is **10**.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA devices and displays the following items:

- SATA Port0/SATA Port1/SATA Port2/SATA Port3/SATA Port4/SATA Port5

SATA Mode

Use this feature to set the SATA mode for a SATA port selected by the user. Select IDE mode to configure the SATA drive as an IDE drive. Select AHCI Mode to enable the SATA drive to support AHCI Interface (Advanced Host Controller Interface). Select RAID Mode to enable the SATA drive for RAID support. The options are **IDE Mode**, AHCI Mode and RAID Mode.

When AHCI is selected, the item-AHCI CodeBase will display:

AHCI CodeBase (Available when RAID or AHCI is selected)

Select BIOS Native Module to use the BIOS Native Mode for the AHCI Interface. Select Intel AHCI ROM to use the Intel AHCI ROM for the AHCI Interface. (Take caution when using this function for this mode is for advanced programmers only.)

When RAID is selected, the items: "AHCI CodeBase" (above), and "ICH RAID Code Base" will appear.

ICH RAID Code Base (Available when the option-RAID is selected)

Select Intel to use Intel SATA RAID firmware for Intel SATA RAID configuration. Select Adaptec to use Adaptec firmware for Adaptec SATA RAID configuration. The options are **Intel** and Adaptec.

SATA Port0 Configuration/SATA Port1 Configuration/SATA Port2 Configuration/SATA Port3 Configuration//SATA Port4 Configuration//SATA Port51 Configuration

These submenus allow the user to configure the following item for a SATA port selected by the user.

eSATA Port Support

Select Enabled to enable a SATA port specified by the user for external SATA connection support. The options are Enable and **Disabled**.

▶USB Configuration

- USB Devices: This feature displays the status of the USB devices detected in the system.

Legacy USB Support

Select Enabled to support Legacy USB devices. If this item is set to Auto, the AMI BIOS will automatically enable Legacy USB support if a legacy USB device is detected. The settings are Enabled, Disabled and **Auto**.

EHCI Hand-Off

Select Enabled to support the BIOS-Enhanced Host Controller Interface to provide a workaround solution for an operating system that does not have EHCI Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

Device Reset Timeout

This setting allows you to decide how long the system should wait in an attempt to detect the presence of a USB Mass Storage Device before it proceeds with the next operation during POST. The options are 10 Seconds, **20 Seconds**, 30 Seconds and 40 Seconds.

Controller Timeout

This setting allows you to decide how long the system should wait for a USB controller or a Mass Storage device to complete its component-related activities, bulk processing or data transferring before the system resume its normal operation during POST. The options are 1 Second, 5 Seconds, 10 Seconds, and **20 Seconds**.

▶Hardware Health Event Monitoring

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting that determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

The options are:

- The Early Alarm: Select this setting to trigger the CPU overheat alarm as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting to trigger the CPU overheat alarm when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling.

Warning! To avoid possible system overheating, please be sure to provide adequate airflow to your system.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlated. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configuration. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, **Balanced/BL**, and Energy Saving/ES.

Fan Speed Readings

The following fan speeds are displayed: Fan1 Speed~Fan 12 Speeds

▶Baseboard Voltage and Temperature

The he following temperature and voltage settings will be displayed (in degrees in Celsius and Fahrenheit) as detected by the BIOS:

- System Temperature, +1.8V Aux, +1.2V BMC, +1.0V NIC, +1,1V AUX, +1.0V PEX, +5.0V, +1.1V, +1.8V, +12.0V, +1.5V, VBAT, +3.3V, and +3.3V VSB.

▶CPU0 Voltage and Temperature~CPU7 Voltage and Temperature

The following temperature and voltage settings of a CPU specified will be displayed as detected by the BIOS:

- System Temperature

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance' level. The onboard

fans and CPU run normally as configured in the BIOS. User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and the CPU 'Temperature Tolerance' level. The onboard fans and CPU run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings. User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached or exceeded. The overheat alarm may be triggered. The system may shut down if it continues for a long period to prevent damage to the CPU.

- CPU Vcore, CPU Vcache, CPU Millbrook 1.1V, CPU Branch0 VDD 1.5V, and CCPU Branch1 VDD 1.5V

▶Super IO Configuration (for the W83527 HG chip)

- Super IO Chip: This item displays the status of the onboard Super IO chip.

Watchdog Function

If enabled, the WatchDog Timer will cause the system to reboot when the system is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

▶Super IO Configuration (for the WPCM450 chip)

- Super IO Chip: This item displays the status of the onboard Super IO chip.

▶Serial Port 0 Configuration/Serial Port 1 Configuration

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This feature indicated if reset is required or not for a serial port specified.

Change Settings

Use this feature to set the optimal Environment_Control_Interface (PECI) setting for a serial port specified. The default setting is **Auto**, which will allow the AMI BIOS to automatically select the best setting for the PECI platform.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **Normal** and High Speed.

▶Serial Port Console Redirection

- **COM 1/COM2**

These two submenus allow the user to configure the following Console Redirection settings for a COM Port specified by the user.

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are **Enabled** and Disabled.

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are **ANSI**, VT100, VT100+, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None**, Hardware RTS/CTS, and Software Xon/Xoff.

Resolution 100x31

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Legacy OS Redirection

Select Enabled for extended-terminal resolution support. The options are **Disabled**, and Enabled.

- **Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)**

The submenu allows the user to configure the following Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection

Select Enabled to use COM Port1 for Console Redirection. The options are **Enabled** and Disabled.

Out-of_Band Management Port

This feature allows the user to select a serial port to be used by the Windows Emergency Management Services (EMS) for remote system management during an emergency. The options are **COM 1** and COM 2.

Data Bits

This feature allows the user to select data bits for console redirection transmission. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent with the data bits for data transmission errors. Select Even if the parity bit is set to 0 and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0 and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use ASCII Character set, Select VT100+ to also include color, function key support. Select ANSI to use Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

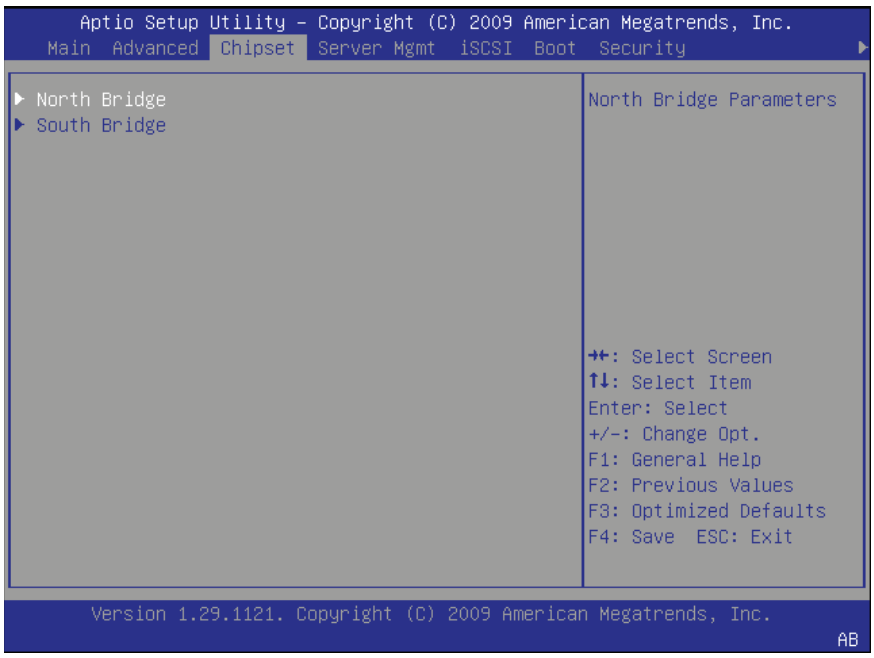
▶Network Stack

Network Stack

Select Enabled enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

7-4 Chipset

Use the arrow keys to select Chipset and press <Enter> to access the submenu items. This submenu allows the user to configure chipset settings.



▶North Bridge

This submenu allows the user to configure the following North Bridge parameters.

▶Boxboro IOH Configuration

- **NB Revision**: This item displays the Boxboro IOH revision number.

▶Intel® VT for Direct I/O Configuration

This feature allows the user to configure Intel Virtualization Technology for Directed I/O settings.

Intel VT-d

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The options are **Enabled** and Disabled.

Interrupt Remapping

Select Enabled to support VT-d Engine Interrupt Remapping. The options are **Enabled** and Disabled.

Coherency Support

Select Enabled to enable Non-Isoch VT-d Engine Coherency support. The options are Enabled and Disabled.

ATS Support

Select Enabled to enable VT-d Engine Address Translation Services support. The options are **Enabled** and Disabled.

Pass-through DMA

Select Enabled to enable Isoch/Non-Isoch VT-d Engine Pass-through DMA support. The options are **Enabled** and Disabled.

Intel® I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. The options are **Disabled** and Enabled.

DCA Support (Available when Intel I/OAT is enabled)

Select Enabled to use Intel's DCA (Direct Cache Access) Technology for data transferring enhancement. The options are **Enabled** and Disabled.

PCIe Gen1 Device Support (Available when Intel I/OAT is enabled)

Select Enabled to support PCI-Express Gen. 1 devices. The options are Enabled and **Disabled**.

IOH PCIe Port Bifurcation Support

This feature displays the following IOH PCIe Port Bifurcation Control settings, which indicate how PCI-Express connections are split into different PCI-E signals for various device support.

- IOH1/IOU2
- IOH1/IOU0
- IOH1/IOU1
- IOH2/IOU2
- IOH2/IOU0
- IOH2/IOU1

▶IOH Thermal Sensors

This feature allows the user to configure integrated thermal sensor settings embedded in the 7500 chipset.

Thermal Sensors

Select Enabled to enable integrated thermal sensors embedded in the 7500 chipset. The options are Enabled and **Disabled**.

- Low Threshold: This item displays the value of the low thermal threshold.
- High Threshold: This item displays the value of the high thermal threshold.
- Catastrophe Threshold: This item displays the value of the catastrophic threshold, beyond which the system enters into the catastrophic state.

▶QPI Link

QuickPath Interconnect (QPI) is the connection between the processors and the I/O hubs (IOH's). This submenu allows the user to configure the following QPI settings.

- Current QPI Link Speed: This item displays the current QPI Link speed.
- Current QPI Link Frequency: This item displays the current QPI Link frequency.

CSI (Common System Interface) Link Speed

This feature allows the user to select the speed for CSI (Common System Interface) Link, which is the former name for QPI Link. Select Fast for POR (Power_On Reset)-related devices. The options are **Slow** and Fast.

QPI Link Frequency Select

This feature allows the user to set the QPI Link Frequency. Select Auto for the AMI BIOS to automatically set the QPI Link Frequency for optimal system performance. The options are **Auto,** 4.8 GT/s, 5.866 GT/s, and 6.4 GT/s.

CRC Mode

Use this feature to enable the CRC (Cyclic Redundancy Check) mode in CSI and select the method used by the CRC mode to detect any accidental changes to raw computer data occurred in digital networks or storage devices. The options are **8_bit CRC** and 16_bit Rolling CRC.

CSI (Common System Interface) Scrambling

Select Enabled to support CSI data scrambling via 0:10h/11h:0:44h:22. The options are **Enabled** and Disabled.

Logical Interrupt Mode

Use this feature to select the Logical Interrupt mode for the programmable interrupt controller (PIC) embedded in a multiple-processor system. Select Flat mode for the PIC to process interrupts in the linear, sequential format. Select Cluster Mode for the PIC to process interrupts in the cascade format. The options are **Flat Mode** and Cluster Mode.

Cluster Mode Check Sampling

Select Enabled for a system to check the APIC ID for non-zero. APIC ID is used to identify a processor in multi-processor systems. The options are **Enabled** and Disabled.

MMIOH Size per IOH

Use this feature to select the MMIOH Size to be allocated to every IOH in the system. The options are **2G**, 4G, 6G and 8G.

Intel reference Code

This item displays Intel IOH Reference code for the system.

Memory Information

The item displays the following memory information:

- Total Memory: This item displays the total memory available in the system.
- Current Memory Mode: This item displays the current memory mode used in the system.
- Current Memory Speed: This item displays the current memory speed of the system.
- Mirroring: This item indicates if memory mirroring is supported by the system for data security enhancement.
- Sparing: This item indicates if memory sparing is supported by the system for memory performance enhancement.

Memory Configuration

This feature allows the user to configure the following memory settings:

Memory Init mode

Select Serial to set the memory initialization mode to Serial. Select Parallel to set the memory initialization mode to Parallel. The options are Serial and **Parallel**.

Page Policy

This feature allows the user to select the memory page policy for virtual memory support. Select Open for a memory control unit to issue a command to open a memory page. Select Closed for the memory control unit to issue a command to close a memory page. Select Adaptive to provide a flexible page policy to better support each individual event. Select Multi-Cas Widget to simultaneously provide memory support to multiple users in a multi-casting format. The options are **Closed**, Open, Adaptive and Muliti-Cas Widget.

Mapping Policy

This feature allows the user to set the policy for memory mapping, which is a file used by the virtual memory system of the OS to access the data in the file system directly instead of accessing the contents stored in a file, one piece at a time, to improve I/O performance. The options are **Closed** and Open.

Scheduler Policy

This feature allows the user to set the policy for memory scheduling for dynamic RAM accessing. The options are **Adaptive**, Static Trade Off, Static Read Primary and Static Write Primary.

NUMA

Select Enabled to enable Non-Uniform Memory Access support to improve CPU performance. The options are **Enabled** and Disabled.

DDR Speed

This feature allows the user to set a speed for onboard DDR modules. Select Auto for the AMI BIOS to set the DDR speed based on the DDR specifications detected in the system. The options are **Enabled** and Disabled.

High Temperature

Select Enabled for high temperature support for onboard memory modules. The options are Enabled and **Disabled**.

Hemisphere

Select Enabled for Hemisphere Mode support to improve the latency of individual memory accessing. The options are Enabled and **Disabled**.

Patrol Scrub

It is a memory error-correction scheme that works in the background looking for and correcting resident errors. The options are **Enabled** and Disabled.

Patrol Scrub Interval

Use this feature to set the hours needed for each Patrol Scrub cycle to complete the task. Select 5 hours for the AMI BIOS to automatically set the time needed for a Patrol Scrub cycle to complete the task. The default setting is **5** (hours).

Socket 0 Branch 0 Sparing/Socket 0 Branch 1 Sparing/ Socket 1 Branch 0 Sparing/Socket 1 Branch 1 Sparing/~/Socket 7 Branch 1 Sparing

Use this feature to enable or disable memory sparing support for the memory modules specified. The options are **Disabled**, DIMM Sparing Enable, and Rank DIMM Enable.

Spare Copy Duration

Use this feature to set the hours needed for each Spare-Copy cycle to complete the task. Select 5 hours for the AMI BIOS to automatically set the time needed for spare copy to complete the task. The default setting is **5** (hours).

Mirroring/Migration

Select Enabled to support memory mirroring/migration to enhance data security. The options are Enabled and **Disabled**.

▶South Bridge

This submenu allows the user to configure the following South Bridge settings.

South Bridge Chipset Configuration

This feature allows the user to configure the following South Bridge parameters.

SMBus Controller

Select Enabled to enable the SMBus (System Management Bus) controller to improve system management. The options are **Enabled** and Disabled.

GbE Controller

Select Enabled to enable the Gigabit PCI-Express controller to enhance PCI-E performance. The options are **Enabled** and Disabled.

Wake On LAN from S5

Select Enabled to "wake up" the system when a network device installed in a LAN port receives a signal while the system is in the S5 state. The options are **Enabled** and Disabled.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power outage. Select Power-On for the system power to be turned on after an outage. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, **Power-Off** and Last State.

Power Button Function

If this item is set to Instant_Off, the system will power off immediately as soon as the user presses the power button. If set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

High precision Event Timer Configuration

This feature allows the user to configure the following South Bridge parameters.

High Precision Event Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Precision Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

PCI-Express_Port Configuration

This feature allows the user to configure the following PCI-E_port settings:

PCI-Express Port 1~ PCI-Express Port 5

Select Enabled to enable the PCI-E port specified by the user. The options are Enabled and **Disabled.**

▶USB Configuration

This submenu allows the user to configure the following USB settings.

All USB Devices

Select Enabled to enable all USB devices in the system. The options are **Enabled** and Disabled.

USB 2.0 (EHCI) Support

Select Enabled for USB 2.0 EHCI (Extended Host Controller Interface) support. The options are **Enabled** and Disabled.

EHCI Controller 1/2

Select Enabled to enable the EHCI controller specified by the user to enhance USB communication. The options are **Enabled** and Disabled.

UHCI Controller1~UHCI Controller 6

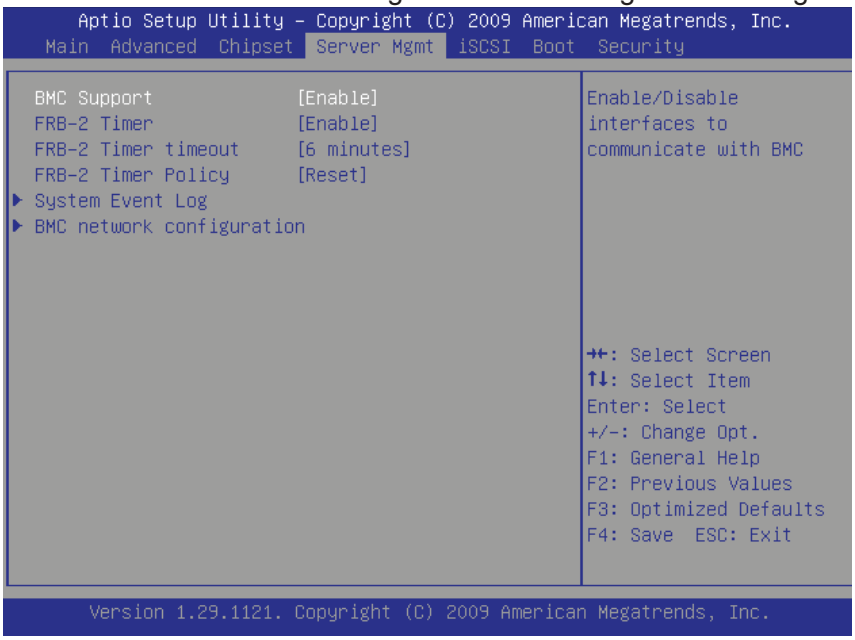
Select Enabled to enable the UHCI (Universal Host Controller Interface) controller specified by the user to enhance USB1.0 communication. The options are **Enabled** and Disabled.

USB Port0~USB Port11

Select Enabled to enable the USB port specified by the user for USB communication. The options are **Enabled** and Disabled.

7-5 Server Management

This section allows the user to configure Server Management settings.



BMC Support

Select Enabled to enable the Baseboard Management Controller. The options are **Enabled** and Disabled.

FRB-2 Timer

Select Enabled to support the Fault_Resilient_Booting Level 2 (FRB-2) Timer, which will allow the system to recover a boot failure from a watch dog timeout during POST. The options are **Enabled** and Disabled.

FRB-2 Timer Timeout

This feature allows the user to select the timeout value (between 3 minutes to 6 minutes) for an FRB-2 Timer, beyond which the activities in an FRB-2 timer will be terminated. The options are 3 Minutes, 4 Minutes, 5 Minutes, and **6 Minutes**.

FRB-2 Timer Policy

This feature allows the user to decide how the system shall respond after an FRB-2 timeout. This feature is not available when the FRB-2 Timer is disabled. The options are Do Nothing, Power Down and **Reset**.

▶System Event Log

Enabling/Disabling Options

Use this feature to enable or disable the following System Event Log (SEL) settings.

SEL Components

Select Enabled to support all features of System Event Logging (SEL) during bootup. The options are Enabled and **Disabled**.

Erasing Settings

This feature allows the user to decide when to erase a System Event Log.

Erase SEL

Select Yes to erase all System Event Logs. The options are Yes and **No**.

When SEL is Full

This feature allows the user to decide what the system shall do when the System Event Log is full. This feature is not available when the FRB-2 Timer is disabled. The options are **Do Nothing**, Power Down and Reset.

Custom EFI Logging Options

Use this feature to customize the settings of Extensible_Firmware_Interface (EFI) Logging between an operation system and the system platform firmware.

Log EFI Status Codes

Select Both to record the microcodes for both OS and the system platform firmware during EFI logging. The default setting is **Both**.

Note: Be sure to reboot the computer for all the changes on the setting indicated above to take effect.

▶BMC Network Configuration

Use this feature to configure BMC (Baseboard Management Controller) Network settings.

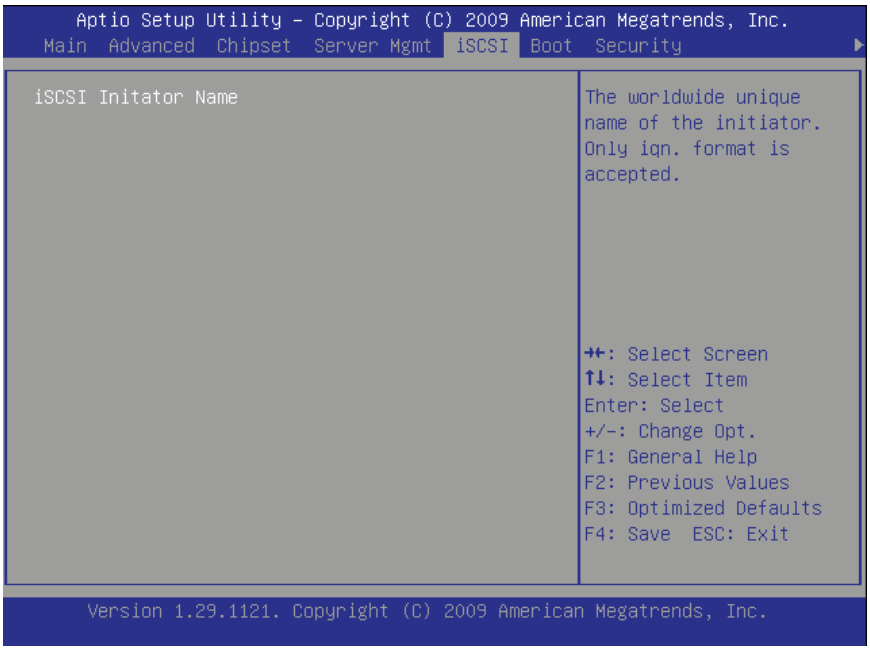
LAN Channel 1/ LAN Channel 2

Configuration Source

Use this feature to select the source or the parameter of an IP address for the LAN channel specified by the user. If Static is selected, you will need to know and manually enter the IP address for the LAN channel specified. If DHCP is selected, BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network it is attached to, and request the next available IP address. If "Do Nothing" is selected, BMC Network parameters will not be modified when the BIOS Setup Utility is in operation. The options are DHCP, Static, and **Do nothing**.

7-6 iSCSI

This section allows the user to configure iSCSI settings.

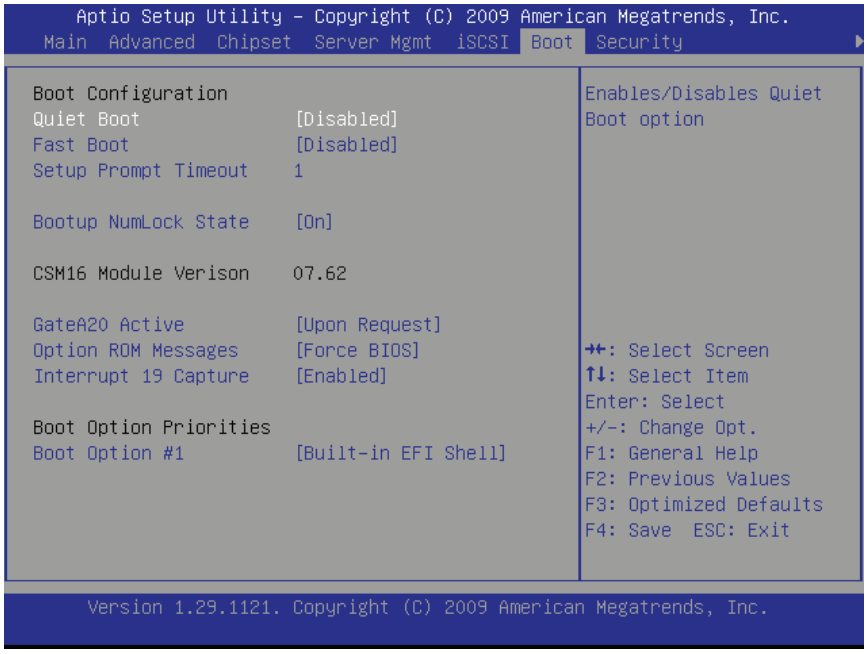


iSCSI Initiator Name

Use this feature to specify the name of your iSCSI initiator. This name will be unique worldwide. Be sure to use the iqn. format when naming your iSCSI Initiator.

7-7 Boot Configuration

This section allows the user to configure Boot settings.



Quiet Boot

This feature allows the user to select the bootup screen display between the POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Enabled and **Disabled**.

Fast Boot

Select Enabled to skip certain tests during POST to reduce the time needed for system boot. This feature has no effect on BBS (BIOS Boot Specification) boot options. The options are Enabled and **Disabled**.

Setup Prompt Timeout

This feature allows the user to specify how many seconds the system shall wait for the BIOS setup activation key to complete its tasks before the system resumes the normal operation. The default setting is **1 Second**.

Bootup Num-Lock

Select On to turn on the Numlock key at bootup. The options are Off and **On**.

CSM Module Version

This item displays the version of CSM (Content Switch Module) currently used in the system.

Gate20 Active

If Upon Request is selected, Gate20 can be disabled via BIOS. Select Always to keep Gate20 always active when executing any RT (Register Transfer) Code above 1 MB. The options are Always and **Upon Request**.

Option ROM Message

Use this feature to select the Option ROM mode setting. The options are **Force BIOS** and Keep Current.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles boot disk functions. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

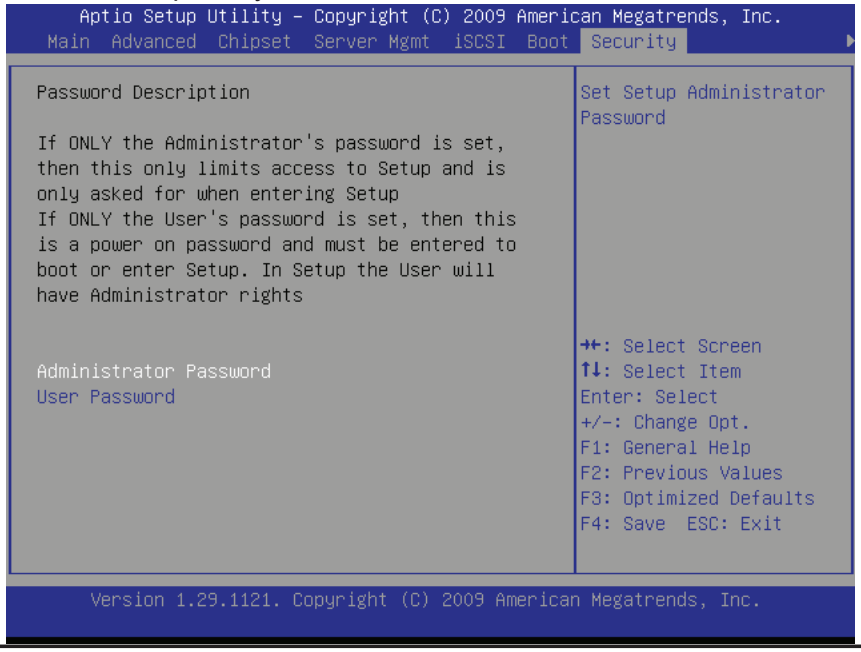
Boot Option Priorities

Boot Option#1

Use this feature to set the system boot sequence. If Built-in EFI (Extensible Firmware Interface) Shell is selected, the Built-in EFI Shell will become the first component to boot. The options are **Disabled** and Built-in EFI Shell.

7-8 Security

Use this section to configure the privilege level of the user when accessing the system or the Setup Utility.



Administrator Password

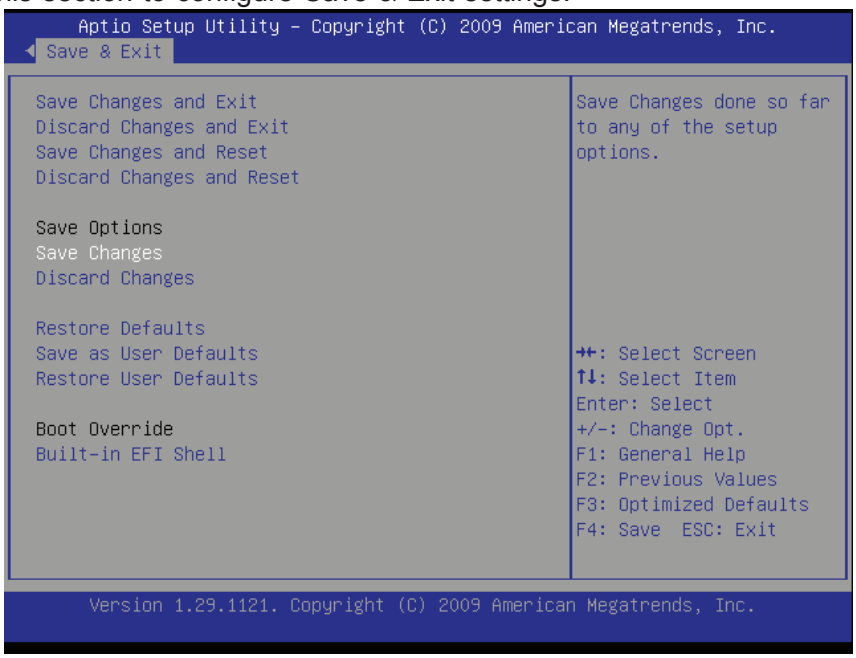
If "Administrator Password" is selected for the system, the user can use an administrator password to enter the BIOS Setup Utility. No password will be needed for the user to enter the system at bootup.

User Password

If "User Password" is selected for the system, a password is needed for a user to enter the system and the BIOS Setup Utility at bootup. While in the BIOS Setup Utility, the user is granted with "Administrator Rights" and is allowed to change configuration settings in the Setup Utility.

7-9 Save & Exit

Use this section to configure Save & Exit settings.



Save Changes and Exit

When you have completed the system configuration changes, select this feature and press <Yes> in the dialog box to save the changes you've made and reboot the system. After system reboot, the new system settings will take effect.

Discard Changes and Exit

Select this feature and press <Yes> in the dialog box to quit the BIOS Setup without making any permanent changes to the system configuration settings.

Save Changes and Reset

Select this feature and press <Yes> in the dialog box to save all the changes you've made and reset the system.

Discard Changes and Reset

Select this feature and press <Yes> in the dialog box to discard all the changes and reboot the system.

Save Options

Save Changes

Select this feature and press <Yes> in the dialog box to save any changes you've made and reboot the system.

Discard Changes

Select Discard Changes and press <Yes> in the dialog box to discard any changes you've made and return to the Setup Utility.

Restore Defaults

Select this feature and press <Yes> in the dialog box for the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but they may not work best for some computer applications.

Save as User Defaults

Select this feature and press <Yes> in the dialog box for the AMI BIOS to save the defaults that you've selected as "User Defaults" for future use.

Restore User Defaults

Select this feature and press <Yes> in the dialog box for the AMI BIOS to restore user default settings that you had previously saved.

Boot Override

Built-in EFI Shell

Select this feature and press <Yes> in the dialog box for the AMI BIOS to save the changes you've made on Built-in EFI Shell settings and reboot the system.

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the bootup process. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue to bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

A-1 BIOS Error Beep Codes

Beep Code/LED	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
OH LED On	System OH	System Overheat

Notes

Appendix B

System Specifications

Processors

Eight Intel® Xeon 7500 Series 8-core processors and next generation Xeon E7 8800 family 10-core processors

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel 7500 chipset (+ICH10R)

BIOS

32 Mb AMI® SPI Flash EEPROM

Memory Capacity

64 DIMM slots that can support up to 2 TB of ECC registered DDR3-1066/800 SDRAM

Note: see Section 5-2 for details.

SATA Controller

ICH10R (on-chip) SATA controller for 6-port, 3 Gbps SATA 2.0 (RAID 0, 1, 5 and 10 modes supported, RAID 5 supported in Windows only)

Drive Bays

Sixteen hot-swap drive bays to house 2.5" SATA drives

Expansion Slots

Four PCI-E 2.0 x16 and two PCI-E 2.0 x8 (in x16 slots) or 10 PCI-E 2.0 x8 standard size add-on cards

Baseboard

X8OBN-F (Proprietary form factor)
Dimensions: 16.64 x 8.1 in (423 x 206 mm)

Chassis

SC758A-R2800B (5U rackmount)
Dimensions: (WxHxD) 437 x 219 x 762 in. (172 x 86 x 300 mm)
Weight (Net): 176 lbs. (80 kg.)

System Cooling
Six 9-cm hot-plug fans

System Input Requirements
AC Input Voltage: 180-240 VAC
Rated Input Current: 7.2A (180V) to 9.5 (240V)
Rated Input Frequency: 50-60 Hz

Power Supply
Rated Output Power: 1400W w/PFC (Part# PWS-1K41F-1R)
Rated Output Voltages: +12V (117A), +5Vsb (6A)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 20% to 95% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes

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